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Maternal and Child Health on the U.S.-Mexico Border

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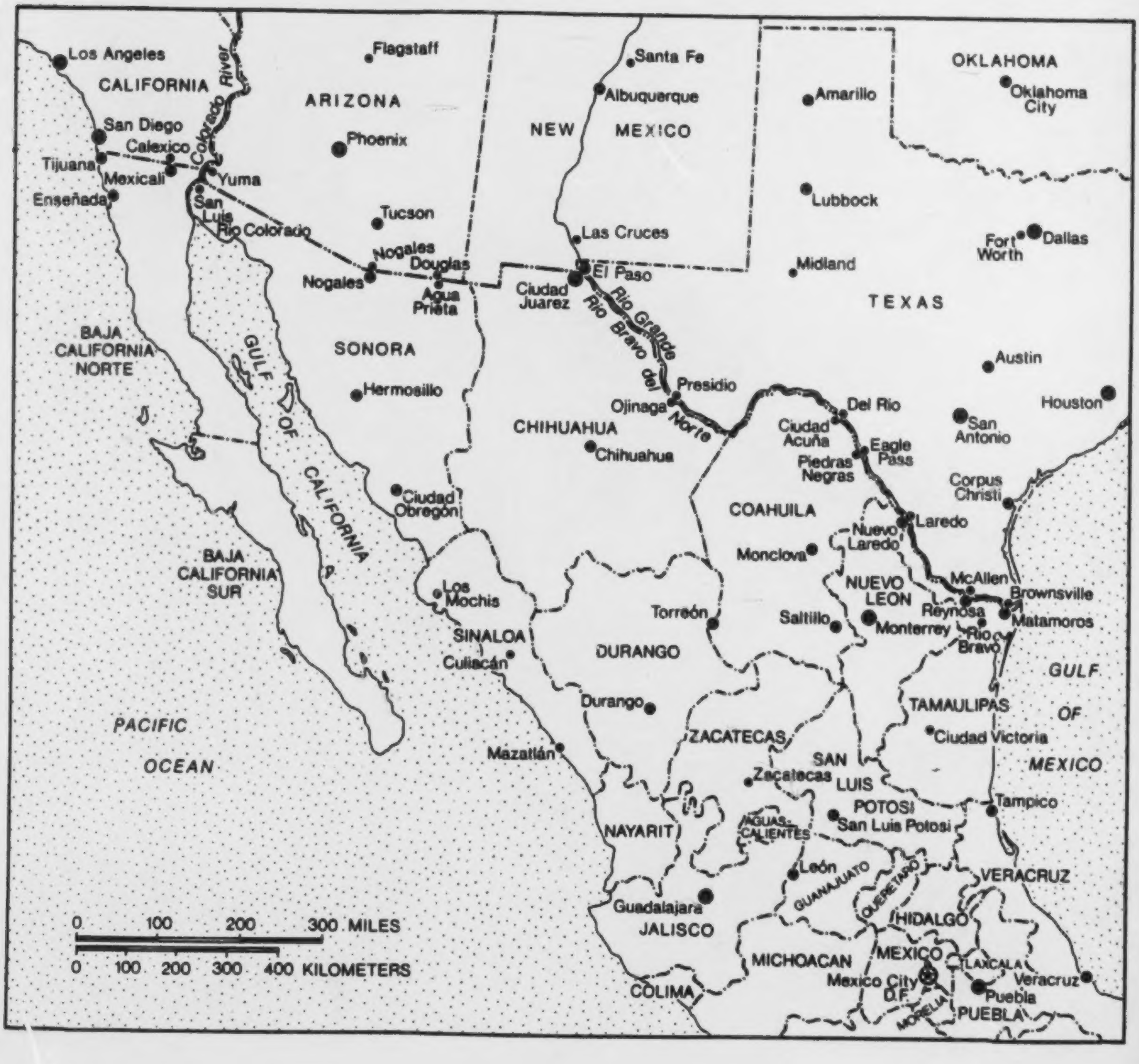
REGIONAL PERSPECTIVE OF THE U.S.-MEXICO BORDER



Frontispiece

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Earlier publications from this project include six regional studies that examine demographic, health status, socioeconomic, medical facility, and medical utilization variables for each of the six urbanized areas on the U.S.-Mexico borders. These studies, published by the American Academy of Pediatrics, provide baseline data for researchers.[1] Also five studies by students in the project were published as working papers by the LBJ School of Public Affairs[2] and the proceedings of a planning conference held in El Paso in November 1981 were published by the American Academy of Pediatrics.[3]

In this synthesis we have depended primarily on data available at the time of our earlier studies. This has been due to limited time and resources as well as a belief that if we can provide future analysts and policymakers with a reasonably comprehensive picture of conditions in the late seventies and early eighties, their task of understanding the process of change will be facilitated. We know that this approach means that we are not able to document the substantial changes which took place after 1981-82 with the collapse of oil prices and the accelerating decline in the peso.

The overall project was initiated by the American Academy of Pediatrics and its Community Health Services Committee. The Academy was responding to an invitation in 1979 by one of its members, Dr. Salvador Guerra-Jimenez, who was also President of the Mexican Confederacion Pediatrica and Minister of Health for the state of Guanajuato. He encouraged the Academy to become involved in the U.S.-Mexico border health initiative that had recently been inaugurated.

At the time of initiation the Community Health Services Committee was chaired by Dr. Fernando Guerra and included Dr. Antoinette Eaton, Dr. Louis Fine, Dr. Paul LaMarche, Dr. William Oberman, Dr. Bernard Portnoy, Dr. Theodore Scurletis, Dr. Earl Siegel, and Dr. Stewart Wagoner. In mid-1982 Dr. Antoinette Eaton became chair of the committee and additional members included Dr. Steve Barnett, Dr. Albert Gaskins, and Dr. David Kaplan.

A project advisory committee was further appointed which includes Dr. Stanley Fisch, Dr. Fernando Guerra, Dr. Doris Howell, Dr. Robert Frazier, Dr. Salvador Guerra-Jimenez, Dr. Bernard Portnoy, Dr. Clift Price, Dr. Earl Siegel, Dr. Ramiro Vega Valdez, and Dr. David Warner.

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1. The regional studies published by the American Academy of Pediatrics include:

(1.) Eloise Cohen, Eve Powell-Griner, Ann Henry, Susan Jones, Susan Krivacic, Susan Marshall, and Rachel Spector, Maternal and Child Health on the Lower Rio Grande Valley, 1983.

(2.) Selma Cuellar, Barbara King, Teresa Lewis, Margaret Mendez, and Carlton Schwab, Maternal and Child Health in the Mid Rio Grande Valley, 1983.

(3.) Patrice Beauchemin, Judy Fitzgerald, Tammy Linbeck, Tess Nira, Christine Petry, Guymon Phillips, and Lynn Whitten, Maternal and Child Health in Region III (El Paso-Juarez), 1983.

(4.) Lise Glancy, Carol Helliker, Melanie Miller, and Rachel Speltz, Maternal and Child Health in Region IV (Tucson, Nogales, Sonora Region), 1983.

(5.) Jo Carcedo, Alfonso Ortiz, David Sanders, Jane Schneckenburger, and Janet Shellenberger, Maternal and Child Health in Region V (Imperial County, Mexicali, Yuma, and San Luis Rio Colorado), 1983.

(6.) Andrew Feldman, Shelly Friend, David Garza, Paul Goren, Gary Watts and Mary Whiting, Maternal & Child Health in Region VI, (San Diego-Tijuana), 1983.

2. The working papers published by the LBJ School of Public Affairs include:

(1.) Eve Powell-Griner, Characteristics of Births in Two Areas of Texas: 1980, Working Paper No. 21, 1983.

(2.) Ann E. Henry, Texas-Mexico Border Area Migration for Acute Care Hospital Admission, Working Paper No. 22, 1983.

(3.) Rachel Spector, The Utilization of Parteras as a Source of Maternal and Child Health Care Along the U.S.-Mexico Border, Working Paper No. 23, 1983.

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CHAPTER ONE

INTRODUCTION

In recent years concern about the U.S.-Mexico border and health care on the border has been increasing. Vernon Briggs a decade ago commented that "no other border in the world separates two nations having as great a disparity in the per capita income of their people."[1] And since that time the population of the border has increased rapidly. By 1980 more children were born in poverty in the Mexican municipios bordering Texas and in Texas counties bordering Mexico than in the rest of Texas.

This is just one of many factors that point to the importance of studying border conditions and health problems in order to develop broader binational approaches to even more significant problems. It is not outside the realm of possibility that by the year 2030 there will be two-thirds as many children under the age of 15 in Mexico as there will be in the United States.

The future of all of the persons in North America depends upon the development of a wide variety of relationships between Mexican and American citizens and institutions. The initiative developed by the American Academy of Pediatrics focuses on the border, with the aim that binational relationships and programs may be fostered which will be a resource in developing long term cooperation between the two nations on both a governmental and a non-governmental basis.

Similarly, the border in a sense extends far from the counties and municipios which lie along it. Cities such as Los Angeles, San Antonio, Houston, and Chicago have larger populations of persons of Mexican descent than does San Diego, the largest city on the U.S. side of the border. On the Mexican side, states in the central highlands of the country send large numbers of migrants to the border and beyond. Monterrey, with a population well in excess of two million, is by far the largest Mexican city near the border, but we exclude it from our analysis because it is not actually on the border.

We have focused on the border counties and municipios because by limiting our attention we believed we could be reasonably complete. We hope that we have provided data and a perspective upon which subsequent researchers can build.

DESCRIPTION OF THE BORDER

The border between Mexico and the United States spans three thousand kilometers from the Gulf of Mexico to the Pacific Ocean. The terrain varies from coastal plains and foothills to high plateaus and mountains. The climate is arid. Summers are hot and winters are generally mild. The coastal areas obtain relief from summer heat with offshore breezes. The mountain areas can experience winter blizzards.

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[1] Vernon Briggs, Walter Fogel, and Fred Schmidt, The Chicano Worker (Austin: University of Texas Press, 1977), p. 11.

The states of Texas, New Mexico, Arizona, and California are adjacent to the border as are the Mexican states of Tamaulipas, Nuevo Leon, Coahuila, Chihuahua, Sonora, and Baja California Norte. Twenty-four counties are situated on the United States side of the border. The Mexican side has a similar number of municipios (municipalities), the political unit in Mexico most equivalent to U.S. counties.

This study focuses on 12 principal counties and 12 major municipios on the respective sides of the border (figure 1.1). The primary criterion for selecting these counties and municipios for study was the size of their populations. The 12 counties account for over 95% of the U.S. border population. A few medium-sized municipios were not included in the study despite the size of their populations. In these cases either their major communities are located some distance from the border or there is no matching U.S. city of any size.

The study's 24 counties and municipios may be grouped into six fairly distinct regions (figure 1.2). Moving from east to west, these are the (1) Lower Rio Grande Valley, (2) Middle Rio Grande Valley, (3) El Paso/Juarez, (4) Nogales, (5) Imperial Valley, and (6) San Diego/Tijuana.

1.1 Region 1: The Lower Rio Grande Valley

This region is situated at the mouth of the Rio Grande (called the Rio Bravo in Mexico) on the Gulf of Mexico.

The principal counties on the United States side are Cameron and Hidalgo counties in Texas. Cameron County includes the cities of Brownsville, San Benito, and Harlingen, in addition to a number of other smaller incorporated and unincorporated communities. Hidalgo County includes McAllen, Mission, Edinburg, and several other small cities. Both counties have numerous colonias. In Spanish, this term refers to a neighborhood or subdivision, while in the Valley it is used to refer to rural, usually unincorporated, communities.

The principal border municipios in the Lower Rio Grande region are Matamoros, Rio Bravo, and Reynosa. Matamoros is the twin city to Brownsville and Reynosa is situated not far from McAllen. Rio Bravo, an agricultural center, lies between Matamoros and Reynosa. All three of the municipios are located in the Mexican state of Tamaulipas, named after Indian groups in the area during early Spanish colonization.

Cities on the United States side are not particularly large. However, including the many incorporated and unincorporated communities throughout the area, the combined population for the two counties approached half a million persons in 1980. Matamoros and Reynosa, on the Mexican side, each have populations exceeding 200,000 persons. Rio Bravo had another 80,000 residents, resulting in a total official Valley population on both sides of the river that exceeded one million persons in 1980.

The economy of this region is built on agriculture, tourism, and international and retail trade. The two Texas counties have increasingly attracted retirees from the U.S. and Canada in recent years. Light industry established under the "maquiladora," or Border Industrialization Program, is a factor in the economies of both Matamoros and Reynosa. Reynosa is also a center of petroleum extraction activity. The Port of Brownsville contributes to the economy of both South Texas and northeastern Mexico.

1.2 Region 2: The Middle Rio Grande

The principal counties in Region 2 are Webb, Maverick and Val Verde, all in Texas, which contain the cities of Laredo, Eagle Pass, and Del Rio, respectively. In 1980, the three counties totalled 166,000 inhabitants, of which almost 100,000 lived in Webb County. This area is not characterized by the large numbers of rural settlements typical of the Lower Rio Grande Valley. Most of the population is concentrated in the three major cities.

The principal Mexican sister municipios in the region are Nuevo Laredo, Piedras Negras, and Acuna. The three municipios had official 1980 populations of 203,000, 80,000, and 42,000 respectively. Thus, the principal counties and municipios had a combined population of one-half million persons. Nuevo Laredo is in the Mexican state of Tamaulipas; Piedras Negras and Acuna are located in the state of Coahuila, also named after indigenous tribes. The Mid-Rio Grande region also touches the Mexican state of Nuevo Leon. However, only a very small community (Anahuac) abuts the United States. The economy of this region includes ranching, tourism, and international and retail trade, as well as coal and gas extraction. Monterrey, the capital and largest city in Nuevo Leon, had a 1980 population greater than any Mexican border city. It is located 150 miles south of Laredo.

1.3 Region 3: El Paso/Juarez

El Paso County, Texas, had a 1980 population approaching 480,000. The neighboring municipio of Juarez, Chihuahua, had a census population of 567,000 (unofficial estimates range to one million). Thus, the region's 1980 population exceeded one million persons. Although New Mexico touches this region, only the relatively small city of Columbus (site of Pancho Villa's raid in 1916) lies on the border. Thus, no counties from New Mexico were included among the major counties in this study.

Because of the large populations on both sides of the border, it is difficult to summarize the economy of this region. The presence of military installations adds an important dimension to El Paso's economy, which is otherwise characterized by trade, industry, and tourism. Juarez also has substantial industrial, trade, and tourism activity. Unlike any of the other border regions, these twin cities are the major metropolitan area for a region at least 400 miles in radius.

1.4 Region 4: Nogales

Three Arizona counties -- Cochise, Santa Cruz, and Pima -- are included in Region 4. The cities of Bisbee and Douglas are in Cochise County with Douglas located immediately on the border. The city of Nogales, Arizona, is located in Santa Cruz County directly across from its sister city, Nogales, Sonora. Tucson, the largest city and county seat of Pima County, is located some seventy miles to the north of the border. In 1980, the combined population of these counties was 638,000, of which 531,000 lived in Pima County, 86,000 in Cochise County, and a mere 20,000 in Santa Cruz County.

Cochise County is distinguished economically by the presence of a substantial copper industry. Growing retirement communities and a military base in the Sierra Vista/Fort Huachuca area of the county also contribute to the local economy. Santa Cruz County is more dependent on trade, especially with Mexico. Tucson, home of the University of Arizona and its School of Medicine, in Pima County, has a diverse economy with a strong service component.

Across the border are the municipios of Agua Prieta and Nogales in the state of Sonora. Their combined 1980 population was 102,000, of which 34,000 lived in Agua Prieta and at least 68,000 in Nogales. Both municipios have substantial agricultural activity as well as light industrial assembly plants (maquiladoras). Nogales also benefits from tourism.

1.5 Region 5: The Imperial Valley

This region, broadly referred to as the Imperial Valley in this report, actually embraces two sub-regions: the Imperial Valley proper in California (Imperial County), and Yuma County in Arizona. Yuma County is opposite the municipio of San Luis Rio Colorado, Sonora. The major Mexican population center across the border from Imperial County is the municipio of Mexicali, the capital of the state of Baja California Norte.

The two U.S. counties each had populations of slightly over 90,000 persons in 1980. Yuma County contains the cities of Yuma and Somerton. Imperial County includes the cities of El Centro (the county seat), Calexico (directly opposite Mexicali), and Brawley (in the north toward Palm Springs). The municipio of San Luis Rio Colorado had 93,000 persons and Mexicali, the largest center of population in the region, had 510,000 persons. Both sides of the border in this region are strongly dependent on agriculture. Those communities directly on the border benefit additionally from international trade.

1.6 Region 6: San Diego/Tijuana

San Diego County, California, had a 1980 population of 1.86 million persons, which was almost as great as the total population for the other eleven U.S. border counties. San Diego has a very diverse economy which includes significant tourism and defense industries, including military bases.

Tijuana, Baja California Norte, had an official population of 460,000 persons in 1980. Unofficial estimates of Tijuana's population reach as high as one million persons. Even the official population estimates imply a 34% growth in the number of residents since 1970, a rate that matches the tremendous growth in San Diego County. Tijuana, like San Diego, has a diverse economy which includes industry, trade, and tourism.

The size of their combined populations in 1980 would make this metropolitan area one of the ten largest in North America. More important for the analysis reported here, the sheer size of San Diego/Tijuana distinguishes this region from the rest of the population centers along the U.S.-Mexico border. Because of differing demographic characteristics and economies in this region, it is important that the interpretation of summary health statistics for the border as a whole recognize the anomalous situation of this western end of the U.S.-Mexico border.

1.7 Overview

In summary, the border may be characterized as a grouping of six or more urbanized regions spread along nearly 2,000 miles. The distances between centers are often substantial, and the differences among cities on the U.S. side and among those on the Mexican side are great. There is little commerce or communication that moves along the border -- it is across the border that most daily activities are focused. These cities often have more in common with their immediate neighbor across the border than they do with the other U.S. or Mexican border cities. This is because family, employment, recreation, and even electronic media bind many of these twin cities into single metropolitan areas.

In the chapters that follow we will discuss the demography, health resources and patterns in births, deaths, and disease of these six distinct regions along the U.S.-Mexico border.

FIGURE 1.1

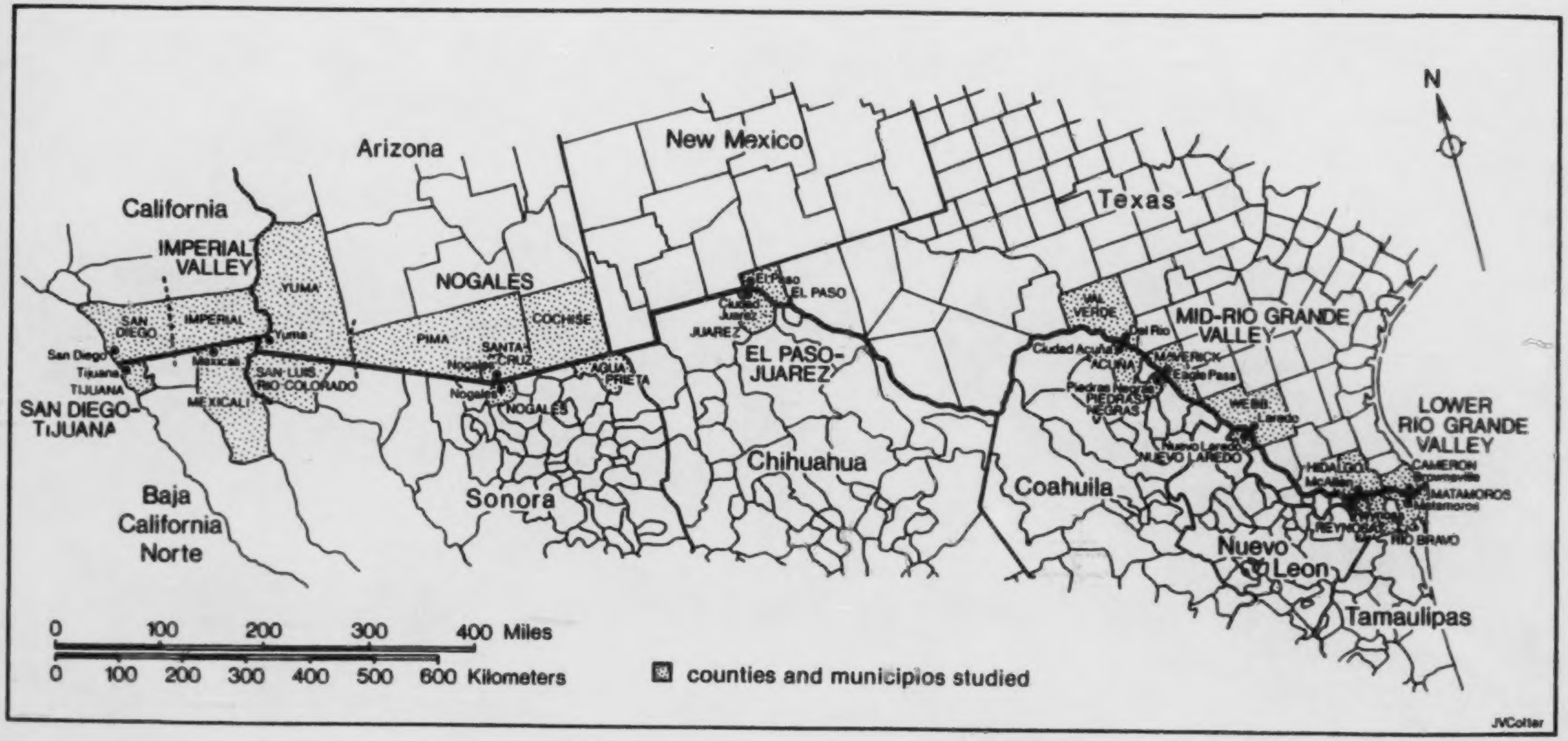
STUDY REGIONS, PRINCIPAL COUNTIES AND MAJOR MUNICIPIOS ALONG THE BORDER

Study Region	County, State	Municipio, Estado*
1. Lower Rio Grande Valley	Cameron, Texas	Matamoros, Tamaulipas Rio Bravo, Tamaulipas Reynosa, Tamaulipas
	Hidalgo, Texas	Reynosa, Tamaulipas
	Webb, Texas	Nuevo Laredo, Tamaulipas
2. Mid Rio Grande	Maverick, Texas	Piedras Negras, Coahuila
	Val Verde, Texas	Acuna, Coahuila
3. El Paso-Juarez	El Paso, Texas	Juarez, Chihuahua
4. Nogales	Cochise, Arizona	Agua Prieta, Sonora
	Santa Cruz, Arizona	Nogales, Sonora
	Pima, Arizona	
5. Imperial Valley	Yuma, Arizona	San Luis Rio Colorado, Sonora
	Imperial, California	Mexicali, Baja California Norte
6. San Diego-Tijuana	San Diego, California	Tijuana, Baja California Norte

* The Mexican state of Nuevo Leon has no major city on the border.

FIGURE 1.2

U.S.-MEXICO BORDER



CHAPTER 2

THE BORDER POPULATION

According to the 1980 U.S. census there were slightly more than four million inhabitants in the 24 counties on the United States side of the border. Of these, 3.8 million lived in the 12 principal counties (table 2.1). According to the Mexican census, the 1980 population for the principal municipios was 2.6 million. Thus, the principal counties and municipios along the border had a combined 1980 census population of around 6.4 million persons. The minor border counties had just under 200,000 persons in 1980 (table 2.2). However, half of this number were in Dona Ana County, New Mexico, where the principal city of Las Cruces is situated some distance from the border.

In the United States, many demographers believe the Census undercounts minority groups, especially young males. Given the large numbers of illegal immigrants in the border area, we can only assume that the problem of undercounting is exacerbated. On the Mexican side, we have similar doubts about the accuracy of census counts. Thus, the reader is cautioned against blind acceptance of the numbers on either side of the border. A key point here is that the border consists of a series of highly urbanized communities. While the casual visitor to the Lower Rio Grande Valley may initially view the area as consisting of small towns, in reality the Valley is a metroplex with more than a million residents. Another key point is that calculation of ratios and rates using a population as a denominator is of limited value. Nevertheless, the report makes extensive use of such calculations in order to make comparisons between areas, and the reader should understand these potential limitations in advance.

2.1 Population Growth

Both sides of the border experienced significant growth in population between 1970 and 1980 (table 2.1). While the total United States population increased by 11.4% over the decade, the principal border counties increased populations by 40.5%. The population of the major municipios grew by 34%, which was similar to Mexico's total population growth of 37.5% over the decade.

The population in some of the counties increased very rapidly between 1970 and 1980. The population of Maverick County increased by 73.5%, Pima by 51.1%, Hidalgo and Cameron by 56.0% and 49.4% respectively, and Yuma County by 48.8% between 1970 and 1980. In Texas and California, growth in the border counties far surpassed the overall state growth of 27.1% and 18.5% respectively. Only in Arizona did the statewide growth of 53.1% exceed growth in the border counties.

On the Mexican side, Piedras Negras (71.9%), Agua Prieta (47.7%), San Luis Rio Colorado (45.9%), and Reynosa (40.2%) had the highest rates of population growth from 1970 to 1980. The rates of population increase for the rest of the municipios were lower than the increase for Mexico as a whole.

Population growth over the previous decade (1960-1970) was less substantial in the counties (21.8%), although still larger than the overall United States increase of 13.4%. The municipios, however, increased population by a remarkable 65% between 1960 and 1970. Thus, population growth appears to have accelerated in the counties and many have decelerated in the municipios over the last two decades.

2.2 Urban and Rural Populations

The great majority of border county residents live in urban areas (places with 2,500 or more persons). In 1980, of the total 4.0 million residents, 3.8 million lived in the 12 principal counties and 3.4 million lived in urban areas within those principal counties. Thus, 89% of the residents of the principal counties lived in cities containing 2,500 persons or more. Webb, Val Verde, El Paso, and San Diego counties each had more than 90% of their residents in urban areas. Only Maverick (68%), Cochise (61%), Yuma (70%) and Imperial (70%) counties were proportionately less urban than the United States as a whole (74%).

2.3 Age Distribution

Figure 2.1 presents the 1980 age and sex distributions on a percentage basis for the United States as a whole, for the 12 principal border counties and for the 12 major border municipios. The population pyramid for the United States as a whole portrays a relatively older population than do the pyramids for the combined border counties or the municipios. The pyramid for the 12 border counties indicates a proportionately larger population of children and young adults and a relatively smaller elderly population than the U.S. as a whole. Perhaps the large numbers of young adult males in the counties reflect the presence of military facilities in San Diego, Tucson, El Paso, and Del Rio, or selective migration to and from the region. The population pyramid for the municipios indicates the presence of a substantial population of children and teenagers. A relatively large portion of the young adult population in the municipios is composed of women.

Because more than 60% of the U.S. border county population lives in either San Diego County or Pima County (Tucson, Arizona), which have demographic characteristics very different from the other ten counties, a fourth pyramid is presented showing the population distribution excluding San Diego and Pima counties. This pyramid has a much broader base than the pyramid for the U.S. as a whole, although not as broad as the base of the pyramid for the municipios. Forty-one percent of the population in the ten border counties was under age 20, compared to 32% for the U.S. as a whole and 53% for the border municipios. Of substantial interest to this study is the larger population of adult women (compared to men) above age 24 in the counties. This effect does not appear in U.S. national data until after age 34. However, in municipios the imbalance begins after age 14. The extent to which this result is an artifact of census error or demographic fact is unknown.

In 1980 the median age for the United States was 30 years old. The border counties had an overall median age of 27.7 years (table 2.3). However, this figure is strongly influenced by the relatively larger and older populations of San Diego and Pima counties. The median ages for the Texas counties were lower, ranging from 22.3 to 25.0 years. In the border municipios the much lower median age of 18.7 years was slightly higher than Mexico's overall median of 18.1 years in 1980.

2.4 Children

The 12 border counties had 306,800 children under the age of five in 1980 (table 2.3). The municipios, despite a smaller total population, counted 329,600 children in this age group. Thus, the principal counties and municipios combined had about 636,400 children under age five in 1980.

San Diego County had proportionally less children than the United States as a whole. In the United States, 7.2% of the population was under age five in 1980. San Diego and Pima counties had 6.9% and 7.2% respectively. However, in the remaining ten counties, young children constituted much larger portions of the total populations. In Santa Cruz and five of the Texas counties, over 10% of the residents were under age five. About 13% of the residents of the municipios were under age five in 1980. This figure is slightly lower than the 13.8% figure for Mexico as a whole, but is higher than those for the border counties.

Persons under the age of 15 constituted almost one-fourth of the border county population in 1980. Only San Diego (20.6%) and Pima (21.7%) counties had proportionately smaller representation for this age group. In the remaining counties, children under age 15 exceeded 25% of the population. The five eastern Texas counties had particularly large percentages. In Maverick County, 34.4% of the population was under age 15. In Webb County, it was 32.6%, and in Hidalgo and Cameron counties 32.5% and 31.8%, respectively.

The 12 border municipios had an overall 41% of their population under the age of 15, compared to 24% for the 12 border counties. However, 32% of the combined populations of the five eastern Texas counties were under age 15.

2.5 Ethnic Composition

In 1980 the Spanish origin (Hispanic) population constituted 35% of the combined populations of the twelve border counties (table 2.4). Four counties -- San Diego, Yuma, Pima and Cochise -- had proportionately smaller representation. The remaining counties had proportionately greater Hispanic representation. In five of the counties, individuals of Spanish origin accounted for more than two-thirds of the population. Four of these were in Texas. In two counties -- Maverick and Webb -- Hispanics exceeded 90% of the county population. By comparison, only 6.4% of the total United States population was of Hispanic origin in 1980.

The non-Hispanic population consists of whites, blacks, and others (Asian, native American, etc.). Almost all of the non-Hispanic population in each county was white. In only three counties -- El Paso, Cochise, and San Diego -- did the black population exceed 3% of the totals. Four counties -- Pima, Yuma, Imperial and San Diego -- had "other" populations exceeding three percent of their totals.

A change in census procedures from 1970 to 1980 resulted in increased counting of persons of Spanish origin. Thus, figures for the two periods are not entirely comparable. However, since 1970, the count for the Spanish origin population in the border counties increased by 50% (table 2.5). As a percentage of the total population, it increased from 33% to 35%, which may have resulted entirely from the new census method. In four counties -- Maverick, Cochise, Santa Cruz and Pima -- the census of Hispanic population decreased in terms of percentages of the county populations.

The Spanish-origin population had an age distribution differing from that of the non-Spanish population (table 2.6). For the 12 border counties combined, 11.4% of the Spanish-origin population was under age five, compared to only 6.2% of the non-Hispanic population. Of the Spanish-origin population, 41.2% was under age 18, compared to 23.7% of the non-Spanish population. While some variation exists from county to county, the general pattern does not change and the differences between counties are slight. Thus, the observed differences in age distributions among counties are primarily due to differing ethnic compositions. In those counties with the greatest Hispanic representation, particularly Santa Cruz, Imperial, and the Texas counties, the proportion of young children in the population is higher.

2.6 Women of Fertile Age

The 12 border counties had 891,544 women of fertile age (15-44) in 1980 (table 2.7). This number constituted 23% of the total county population. The municipios had 606,040 women of fertile age in 1980, also constituting 23% of their total population. Thus, the principal counties and municipios combined had almost 1.5 million women of fertile age.

Between 1970 and 1980 the number of women of fertile age in the counties increased by 56.3%, a rate well above the overall population growth of 40.5%. In the 11 municipios, the population of women of fertile age increased by 47%, which was also higher than the 34% growth in total population for the municipios.

2.7 Family Structure

In the predominantly Hispanic border counties, those households having children under age 18 were more likely to be married-couple families as opposed to non-married (single-parent or non-family) households. These indicators suggest that Hispanic populations on the border have relatively strong familial systems. In 1980, however, the U.S. Census shows that of the 538,360 border county households with children under age 18, 18% were headed by female parents with no husband present, 3.4% were headed by single fathers with no wife present, and 1% were non-family households. Thus more than 22% of the households with children were not married-couple families. Although the presence of military installations may have some bearing on these measures, those counties with relatively larger Hispanic populations tended to fare better by this measure of family stability.

Of 1.14 million persons under age 18, 74% were living in married-couple families. Except for Pima and San Diego, each of the counties exceeded this percentage. For the entire U.S. side of the border, almost 17% (191,300) of the children were living in single-parent families. All the counties except San Diego had smaller percentages for this measure. In the 12 counties, 6.7% (76,700) of the children lived with relatives other than their parents. All counties except Cochise and San Diego exceeded this percentage. These measures indicate that, in those counties with relatively large Hispanic populations, children are more likely to live with both parents; less likely to live with a single parent; and, when families do break up, other relatives provide substantial support. For the U.S. border as a whole, however, almost 200,000 children lived in single-parent families and another 100,000 did not live with either parent.

2.8 Income, Education and Employment

In 1980 respondents nationwide to the U.S. Census estimated their 1979 median family income to be $19,908. San Diego, with a median income of $20,306 and Pima with one of $19,000, were the only two border counties with incomes at or close to the U.S. median (table 2.9). The remaining ten counties all had median family incomes that were markedly lower. Five of the counties, all in Texas, had median family incomes below $13,000. Maverick County's median was $10,623.

The 12 border counties had 632,367 residents in 1980 with 1979 incomes below the poverty level of $7,400 for a family of four persons. This number had increased by 21.6% from 520,000 in 1970 despite a decline in the poverty rate. The 1979 poverty rates differed substantially from county to county. San Diego and Pima counties had 1979 poverty rates of 11.3% and 13.0%, respectively. El Paso and the remaining Arizona and California counties had poverty rates between 14.9% and 21.7%. The remaining five counties, all in Texas, had rates ranging from 30% to 39.5%.

Although the overall poverty rate for the border counties declined from 1970 to 1980, the rates for three of the counties -- Maverick, El Paso, and San Diego -- increased. Poverty is particularly acute among the Hispanic population. Overall, Hispanics in the border counties experienced a 29.7% poverty rate in 1979. In three of the Texas counties, the poverty rate exceeded 40% among Hispanics.

In 1980 just under two-thirds of all Americans ages 25 and older had high school diplomas. For the border counties, the figure was just over two-thirds. However, high levels of education in San Diego (78.0%) and Pima (74.6%) counties mask the low rates in other counties. In seven of the counties, fewer than 60% of the adults had high school diplomas. The rates were under 45% for the four eastern Texas counties. Less than one-third of adults in Maverick County had high school diplomas.

In 1980 the unemployment rate for the United States was 6.7% . Four of the border counties had equal or lower unemployment. Two of the counties, Maverick and Cochise, had unemployment exceeding 10%. In May 1983, following a U.S. recession and devaluation of the peso in Mexico, all but two of the border counties had unemployment exceeding 10%. The rate in three counties exceeded 20%.

In Mexico as a whole, 64.4% of persons ages 20 and older had no more than six years of formal education in 1980. In the border states, Baja California Norte (41.5%) had much higher levels of formal education. Patterns in the other Mexican border states more closely matched the ratios for the nation as a whole. State level census data for 1980 indicate that at least 84% of the residents ages 15 and older in each of the states were literate. This figure exceeded Mexico's overall 79%. Variations between the municipios with regard to education appear to be related to the degree of urbanization, with the more rural municipios such as Agua Prieta, Acuna and San Luis Rio Colorado having higher percentages of persons with less than a sixth grade education. Despite these differences there was a much lower level of education on the Mexican side of the border. The 15-44 age group had much more education than the 45+ age group (table 2.10).

Table 2.11 shows labor force participation rates by municipio and the percent employed in various sectors in 1980. This table also shows the percent of the economically active population in each municipio earning less than roughly $265 (U.S.) a month. There is clearly substantial variation in the composition of economic activity between municipios as well as the level of income.

Census data for 1980 concerning industries of employment in the border counties reflect the various local economies (table 2.12). Relatively large portions of the employed were active in agriculture, forestry, fisheries, or mining in Hidalgo, Maverick, Yuma, and Imperial counties. Most of these were employed in agriculture. However, some mining and oil and gas industry is present in localized areas. Employment in manufacturing was more prevalent in Cameron, Maverick, El Paso, and San Diego counties, although none of the border counties approached the U.S. national figure of 22.3% employed in manufacturing reported by the U.S. Census. With the rapid increase in development of maquiladoras on the Mexican side, however, manufacturing is becoming very important in the twin cities. Wholesale and retail trade provided a relatively large share of the jobs along the border. Each county exceeded 20.5% employed in trade, the U.S. national average reported by the census. In Webb County, the figure was as high as 28.3%. In Hidalgo, Cameron and Yuma counties, the figure was about 25%.

In the 12 border counties, 116,339 people were employed in health services in 1980 (table 2.13). However, 74% of these were in San Diego and Pima counties. Each of the other 10 border counties had under the national level of 7.4% of the employed engaged in health services. In eight counties, fewer than 6% of the employed persons were active in health services. Four of the Texas counties and Imperial County had less than 2% of their populations engaged in health services.

2.9 Migration

Relatively large numbers of people in the border counties were born outside of the United States (table 2.14). In the United States as a whole, 6% of the 1980 population was foreign born. For the border counties, the figure was 15%. Five of the counties exceeded 20% and two exceeded 30% for this measure.

In the border municipios, 51.6% of the population of Tijuana and almost 38% of the population of Mexicali were born in other Mexican states. The immigration rates for other municipios were somewhat lower, but still significant except for the more rural municipios (table 2.15).

2.10 Housing

Of the 1.4 million housing units in the U.S. border counties in 1980, 1.28 million were occupied. Of these, just under 60% were owner occupied and 40% were renter occupied. Owner occupancy was relatively less common in San Diego County (55%), and relatively high in the remaining counties. Seven of the counties exceeded the national figure of 64.4% for this measure. The Hispanic population differed from the non-Hispanic population with respect to home ownership (table 2.16). Generally, an Hispanic household was somewhat less likely to own their home. However, home ownership among Hispanics on the border (57%) was more common than home ownership among Hispanics elsewhere in the nation (43.5%).

Of the year-round housing units on the border, 8.7% had two or fewer rooms. However, in six of the counties, more than 10% of the units had two or fewer rooms. This information indicates that housing conditions are crowded in these border counties. Crowded housing conditions are further documented by data concerning occupied housing units with five or more persons. Sixteen percent of the occupied units in the border counties had five or more persons in 1980. In the Texas counties and in Santa Cruz and Imperial counties, more than 20% of the housing units had five or more residents. In three of the Texas counties, this figure exceeded 30%. These same counties had elevated rates for the number of households with more than one person per room (another measure of crowding). While San Diego County had 5.5% for this measure, nine of the other counties had much higher percentages. Four Texas counties exceeded 20% for this measure.

In the United States, in 1980, 2.2% of the occupied units had less than complete plumbing facilities for exclusive use. While the overall figure for the border counties is comparable (2.3%), four of the Texas counties exceeded five percent and Maverick County exceeded ten percent for this measure. Almost 30,000 housing units in the border counties containing more than 100,00 people had less than complete plumbing facilities for exclusive use.

In 1980, the average household in the United States had 2.75 persons. The border counties had a higher average household size of 2.88. However, the lower averages for San Diego and Pima counties bring down the overall average, creating an understatement of the situation in the other border counties. Maverick County, for example, had an average household size of 4.05 persons, Webb had 3.79, and Hidalgo had 3.71 persons per household. Large households indicate that low family incomes must be spread over a larger number of individuals. In 11 of the counties, the average number of persons per household declined since 1970, as it did for the nation as a whole. However, in Santa Cruz County, Arizona, the average number of persons per household increased from 3.24 to 3.40. The reasons for this increase are not clear. However, such a situation may indicate a changing population base or deteriorating economic conditions.

About 45% of the population in the border municipios did not have bathrooms with running water in 1980, and roughly 13% had no electricity (table 2.17). More than half of the housing units had two or less rooms.

2.11 Population Summary

The 12 principal border counties had 3.8 million residents in 1980. The 12 principal municipios had about 2.6 million residents. These census figures are probably low. The populations on both sides of the border are growing rapidly. This growth, combined with the relatively young age structure of the border population, indicates that the target groups for maternal and child health services will expand dramatically in the future. In 1980, just over 300,000 children under age five lived in the principal counties and about 330,000 lived in the major municipios. The key border counties had almost 900,000 women of child-bearing age (15-44 years) in 1980. The major municipios had about 600,000 women in the same age group.

Table 2.18 projects populations of the Texas border counties to the year 2000. It shows a 64% projected growth in these counties alone. By the year 2000 it is not unreasonable to think that the total border population will approach 14 million persons. And, if cities within 200 miles of the border such as Los Angeles, Monterrey, San Antonio, Hermosillo, and Ciudad Chihuahua are included, the figure becomes more like 30 million. Given the problems of obtaining an accurate census on the border, such projections, which are based on prior census counts, are subject to considerable error.

Over the last decade, the border population, on average, saw substantial improvements in socioeconomic conditions. However, because of substantial in-migration, primarily by persons at the bottom of the economic ladder, the overall size of the border's indigent population continues to grow. During this and the coming decades, large numbers of children will enter adulthood. Their opportunities and choices will determine whether conditions on the border will continue to improve. It is quite likely that their numbers, weighted by in-migration of new indigent populations, will result in a deterioration of economic status and, consequently, increased risks to the health of women and children.

TABLE 2.1

POPULATION GROWTH ON THE U.S.-MEXICO BORDER, 1960-1980

County	Population 1960	Population 1970	Population 1980	Percent Increase 1970-1980	Percent Increase 1960-1980
Cameron	151,098	140,368	209,727	49.4	38.8
Hidalgo	180,904	181,535	283,229	56.0	56.6
Webb	64,791	72,859	99,258	36.2	53.2
Maverick	14,508	18,093	31,398	73.5	116.4
Val Verde	24,461	27,471	35,910	30.7	46.8
El Paso	314,070	359,291	479,899	33.6	52.8
Cochise	55,035	61,918	85,686	38.4	55.7
Santa Cruz	10,808	13,966	20,459	46.5	89.3
Pima	265,660	351,667	531,443	51.1	100.0
Yuma	46,235	60,847	90,554	48.8	95.9
Imperial	72,105	74,492	92,110	23.7	27.7
San Diego	1,033,011	1,357,854	1,861,846	37.1	80.2
Total 12 Counties	2,232,686	2,720,361	3,821,519	40.5	71.2
State					
Texas	9,579,677	11,198,730	14,229,191	27.1	48.5
New Mexico	951,023	1,017,055	1,302,894	28.1	37.0
Arizona	1,302,161	1,775,399	2,718,215	53.1	108.8
California	15,717,204	19,971,069	23,667,902	18.5	50.6
Total U.S.A.	179,310,655	203,302,031	226,504,825	11.4	26.3

Sources: U.S. Census,1960, 1970 and 1980.

TABLE 2.1 (Cont.)

Municipio	Population 1960	Population 1970	Population 1980	Percent Increase 1970-1980	Percent Increase 1960-1980
Matamoros	143,043	186,146	238,840	28.3	67.0
Río Bravo	42,984	71,389	83,522	17.0	94.3
Reynosa	134,869	150,786	211,412	40.2	56.7
Nuevo Laredo	96,043	151,253	203,286	34.4	111.7
Piedras Negras	48,408	46,698	80,290	71.9	65.9
Acuña	22,317	32,500	41,948	29.1	88.0
Juarez	276,995	424,135	567,365	33.8	104.8
Agua Prieta	17,248	23,272	34,380	47.7	99.3
Nogales	39,812	53,494	68,076	27.3	71.0
San Luís Río Col.	42,134	63,604	92,790	45.9	120.2
Mexicali	143,127	396,324	510,664	28.9	256.8
Tijuana	165,690	340,583	461,257	35.4	178.4
Total 12 Municipios	1,172,670	1,935,184	2,593,830	34.0	121.2
Estado					
Tamaulipas	1,024,182	1,476,817	1,924,934	30.3	87.9
Nuevo León	1,078,848	1,724,854	2,463,298	42.8	128.3
Coahuila	907,734	1,122,538	1,558,401	38.8	71.7
Chihuahua	1,226,793	1,629,456	1,933,856	18.7	57.6
Sonora	783,378	1,112,344	1,498,931	34.8	91.3
Baja Cal. Norte	520,165	888,439	1,225,436	37.9	135.6
Total México	34,923,129	49,005,679	67,382,581	37.5	92.9

Sources: Censo de México, 1960, 1970, and 1980.

TABLE 2.2

POPULATIONS OF MINOR BORDER COUNTIES, 1980

County	State	Population	Under Age 18	Women Ages 15-44	Spanish Origin
Willacy	Texas	17,495	6,743	3,743	14,049
Starr	"	27,266	11,337	5,927	26,428
Zapata	"	6,628	2,286	1,197	5,042
Kinney	"	2,279	728	377	1,310
Terrell	"	1,595	497	312	691
Brewster	"	7,573	2,010	1,792	3,262
Presidio	"	5,188	1,843	995	3,989
Jeff Davis	"	1,647	473	329	777
Hudspeth	"	2,728	1,021	571	1,589
Dona Ana*	New Mexico	96,340	31,148	24,332	50,204
Luna	"	15,585	4,789	2,871	6,148
Hidalgo	"	6,049	2,265	1,330	2,849
Total (Percent of Population)		190,373	65,140 (34%)	43,776 (23%)	116,338 (61%)

Source: U.S. Census, 1980.

* Contains city of Las Cruces, New Mexico, which is situated away from the border.

TABLE 2.3

AGE DISTRIBUTION ON THE U.S.-MEXICO BORDER, 1980

	Population	Percent of Population by Age				
County	Ages 0-4	0-4	5-14	15-64	65+	Median Age
Cameron	21,845	10.4	21.4	58.6	9.6	25.0
Hidalgo	29,854	10.5	22.1	58.2	9.2	24.1
Webb	10,387	10.5	22.1	59.0	8.4	23.6
Maverick	3,329	10.6	23.8	58.8	6.8	22.3
Val Verde	3,604	10.0	21.2	61.3	7.4	24.6
El Paso	44,921	9.4	19.5	64.6	6.6	25.0
Cochise	7,236	8.4	17.3	64.0	10.3	28.8
Santa Cruz	2,060	10.1	19.8	60.8	9.3	27.2
Pima	38,064	7.2	14.5	66.6	11.7	29.5
Yuma	8,137	9.0	17.5	62.5	11.0	27.9
Imperial	8,404	9.1	19.2	62.7	9.0	26.0
San Diego	128,959	6.9	13.7	69.1	10.3	27.3
Total 12 Counties	306,800	8.0	16.3	65.8	9.9	27.7

Municipio	Population Ages 0-4	0-4	5-14	15-64	65+	Unspec.	Median Age*
Matamoros	31,658	13.3	27.5	55.3	3.8	0.1	18.7
Río Bravo	11,445	13.7	29.9	52.8	3.5	0.1	17.5
Reynosa	27,851	13.2	28.6	54.9	3.2	0.1	18.3
Nuevo Laredo	26,091	12.8	28.7	54.5	3.9	0.1	18.5
Piedras Negras	10,071	12.5	28.0	55.0	4.3	0.2	18.5
Acuña	5,861	14.0	29.5	52.8	3.7	0.1	17.7
Juarez	67,962	12.0	28.3	55.9	3.7	0.2	19.0
Agua Prieta	4,921	14.3	26.9	55.4	3.4	0.1	18.6
Nogales	9,491	13.9	26.4	56.3	3.3	0.1	19.0
San Luís Río Col.	12,535	13.5	30.5	53.0	2.9	0.1	17.3
Mexicali	63,089	12.4	28.4	55.9	3.2	0.1	18.6
Tijuana	58,643	12.7	28.1	56.0	3.1	0.1	18.7
Total 12 Municipios	329,618	12.7	28.1	56.0	3.1	0.1	18.7

Sources: U.S. Census, 1980 and Censo de México, 1980.

*Assumes unspecifieds are above median.

TABLE 2.4

ETHNIC COMPOSITION FOR U.S. BORDER COUNTIES, 1980

County	Percent Spanish Origin	Percent Non-Spanish Origin: White	Black	Others
Cameron	77.1	22.2	0.3	0.4
Hidalgo	81.3	18.3	0.1	0.3
Webb	91.5	8.2	0.1	0.2
Maverick	90.3	7.2	0.0	2.4
Val Verde	62.9	34.1	2.0	1.0
El Paso	61.9	32.9	3.7	1.5
Cochise	26.7	66.9	3.6	2.8
Santa Cruz	74.4	24.6	0.2	0.8
Pima	21.0	72.4	2.8	3.8
Yuma	29.4	63.4	2.6	4.6
Imperial	55.8	38.4	2.4	3.4
San Diego	14.8	73.8	5.5	5.9
Total 12 Counties	34.9	57.4	3.8	3.9

Source: U.S. Census, 1980.

TABLE 2.5

CHANGE IN SPANISH ORIGIN POPULATION OF U.S. BORDER COUNTIES, 1970-1980

Hispanic Origin

County	1970 Number of persons of Spanish Origin	1970 Percent of Total Population	1980 Number of persons of Spanish Origin	1980 Percent of Total Population	1970-1980 Percent Increase
Cameron	107,000	76.2	161,654	77.1	51.1
Hidalgo	143,611	79.1	230,212	81.3	60.3
Webb	62,380	85.6	90,842	91.5	45.6
Maverick	16,348	90.4	28,366	90.3	73.5
Val Verde	15,549	56.6	22,601	62.9	45.4
El Paso	204,349	56.9	297,001	61.9	45.3
Cochise	20,594	33.3	22,846	26.7	10.9
Santa Cruz	10,792	77.3	15,229	74.4	41.1
Pima	82,916	23.6	111,418	21.0	34.4
Yuma	16,250	26.7	26,638	29.4	63.9
Imperial	34,260	46.0	51,384	55.8	50.0
San Diego	174,209	12.8	275,177	14.8	58.0
Total 12 Counties	888,258	32.7	1,333,368	34.9	50.1

Source: U.S. Census, 1970 and 1980.

TABLE 2.6

AGE DISTRIBUTION BY SPANISH AND NON-SPANISH ORIGIN, U.S. BORDER COUNTIES, 1980

County	Origin	Percent Ages 0-4	Percent Ages 5-17	Total Population
Cameron	Spanish	11.8	31.3	161,654
	Non-Span.	5.6	17.1	48,073
Hidalgo	Spanish	11.7	31.8	230,212
	Non-Span.	5.4	15.4	53,017
Webb	Spanish	10.7	29.9	90,842
	Non-Span.	8.2	19.5	8,416
Maverick	Spanish	11.1	32.5	28,366
	Non-Span.	5.8	19.2	3,032
Val Verde	Spanish	10.9	32.4	22,601
	Non-Span.	8.5	18.9	13,309
El Paso	Spanish	10.8	29.9	297,001
	Non-Span.	7.0	19.3	182,898
Cochise	Spanish	10.9	29.9	22,846
	Non-Span.	7.6	20.8	62,840
Santa Cruz	Spanish	11.4	29.1	15,229
	Non-Span.	6.3	17.9	5,230
Pima	Spanish	11.6	27.9	111,418
	Non-Span.	6.0	17.5	420,025
Yuma	Spanish	12.6	32.8	26,638
	Non-Span.	7.5	18.5	63,916
Imperial	Spanish	11.2	31.6	51,384
	Non-Span.	6.5	18.7	40,726
San Diego	Spanish	11.5	26.8	275,177
	Non-Span.	6.1	17.2	1,586,669
Total 12 Counties	Spanish	11.4	29.8	1,333,368
	Non-Span.	6.2	17.5	2,488,151

Source: U.S. Census, 1980.

TABLE 2.7

WOMEN OF CHILDBEARING AGE AND AVERAGE CHILDREN EVER BORN ON THE U.S.-MEXICO BORDER, 1970-1980

County	Women Ages 15-44 1970	Women Ages 15-44 1980	Percent Increase 1970-1980	Average Children Ever Born*	
				1970	1980
Cameron	29,797	46,720	56.8		1.76
Hidalgo	38,919	63,697	63.7		1.73
Webb	15,389	22,578	46.7		1.67
Maverick	6,026	7,306	21.2		1.79
Val Verde	3,885	8,171	110.3		1.77
El Paso	81,299	115,501	42.1		1.49
Cochise	12,477	18,874	51.3		1.52
Santa Cruz	2,979	4,577	53.6		1.67
Pima	73,547	126,372	71.8		1.21
Yuma	12,217	19,091	56.3		1.68
Imperial	15,460	20,920	35.3		1.61
San Diego	278,347	437,737	57.3		1.18
Total 12 Counties	570,342	891,544	56.3		1.30
Municipio					
Matamoros	39,087	55,766	42.7	2.82	2.46
Río Bravo	14,307	18,258	27.6	3.18	2.89
Reynosa	32,554	49,271	51.4	2.75	2.50
Nuevo Laredo	32,862	46,740	42.2	2.59	2.51
Piedras Negras	10,033	18,459	84.0	2.61	2.45
Acuña	6,840	9,294	35.9	2.82	2.71
Juarez	91,545	135,697	48.2	2.87	2.54
Agua Preita	4,877	8,072	65.5	2.82	2.41
Nogales	11,586	16,414	41.7	2.63	2.27
San Luís Río Col.	12,929	20,439	58.1	2.97	2.70
Mexicali	82,053	118,419	44.3	2.92	2.42
Tijuana	73,596	109,211	48.4	2.81	2.44
Total 12 Municipios	412,269	606,040	47.0	2.83	2.49

Sources: U.S. Census, 1970 and 1980; Censo de México, 1970 and 1980.

* The U.S. Census definition for average children born changed between the 1970 and 1980 censuses.

TABLE 2.8

INDICATORS OF FAMILY STRUCTURE, U.S. BORDER COUNTIES, 1980

	Households with Children Under Age 18	
County	Percent Married Couple Families	Percent Not-Married Couple Families
Cameron	80.3	19.7
Hidalgo	81.8	18.2
Webb	80.6	19.4
Maverick	83.6	16.4
Val Verde	84.4	15.6
El Paso	79.6	20.4
Cochise	81.6	18.4
Santa Cruz	81.3	18.7
Pima	77.7	22.3
Yuma	83.3	16.7
Imperial	80.4	19.6
San Diego	74.6	25.4
Total 12 Counties	77.6	22.4

TABLE 2.8 (Cont.)

	Persons Under Age 18*			
County	Percent In Married Couple Families	Percent In Single-Parent Families	Percent With Other Relatives	Percent With Non-Relatives
Cameron	75.3	14.5	8.6	0.7
Hidalgo	77.1	13.6	8.2	0.6
Webb	76.4	14.0	8.7	0.3
Maverick	79.1	11.9	7.7	0.3
Val Verde	79.2	11.1	8.7	0.5
El Paso	75.5	15.8	7.4	0.7
Cochise	77.5	14.3	6.4	1.2
Santa Cruz	76.5	14.4	8.2	0.6
Pima	73.6	16.6	7.0	1.8
Yuma	78.6	12.3	7.2	1.2
Imperial	76.0	14.7	7.7	1.0
San Diego	71.8	19.5	5.4	2.1
Total 12 Counites	74.1	16.8	6.7	1.4

Source: U.S. Census, 1980.

* About one percent or less of children in each county have either formed their own households or live in institutional or group quarters.

TABLE 2.9

MEDIAN INCOME AND POVERTY LEVELS, U.S. BORDER COUNTIES, 1969 AND 1979

	Median Family Income-1979		Persons Below Poverty Level*				
				All Persons		Spanish Origin	
County	All Families	Spanish Origin	1969 %	1979 %	1979 #	1979 %	1979 #
Cameron	$12,931	$10,984	46.0	31.8	66,046	38.1	61,065
Hidalgo	$12,083	$10,418	49.8	35.2	99,081	40.9	93,660
Webb	$12,181	$11,346	44.7	33.1	32,492	35.0	31,435
Maverick	$10,623	9,882	30.3	39.5	12,357	40.6	11,493
Val Verde	$12,274	9,819	50.8	30.0	10,482	41.7	9,322
El Paso	$15,366	$12,222	21.4	21.7	101,654	29.2	86,028
Cochise	$15,484	1$12,964	16.1	14.9	12,393	24.9	5,587
Santa Cruz	$16,155	$13,507	24.4	18.1	3,700	22.4	3,400
Pima	$19,000	$16,144	14.2	13.0	67,739	19.7	21,615
Yuma	$15,022	$12,700	16.3	16.0	13,987	24.0	6,975
Imperial	$16,658	$14,130	20.2	15.3	13,896	20.5	10,397
San Diego	$20,306	$15,004	10.9	11.3	198,540	20.8	55,028
Total 12 Counties	--	--	19.1	16.5	632,367	29.7	396,005

TABLE 2.9 (Cont.)

County	Persons Ages 25+ % High School Graduate or More	Unemployment Rate 1980	Unemployment Rate May 1983
Cameron	43.8	7.5	11.1
Hidalgo	41.1	9.0	12.6
Webb	41.4	5.9	13.7
Maverick	32.2	11.7	26.1
Val Verde	51.1	9.1	10.8
El Paso	59.5	7.8	10.4
Cochise	68.8	10.9	11.6
Santa Cruz	54.0	5.5	14.5
Pima	74.6	6.3	8.5
Yuma	61.9	9.3	20.7
Imperial	50.9	8.9	27.6
San Diego	78.0	6.7	8.6
Total			
12 Counties	68.6		

Sources: U.S. Census, 1970 and 1980, and respective state employment agencies.

* The Poverty level was income below $7,400 for a family of four in 1979.

TABLE 2.10

EDUCATIONAL STATUS, PRINCIPAL BORDER MUNICIPIOS, 1980

	Percent of Children Ages 6-14		Percent of Persons Ages 15-44		Percent of Persons Ages 45+	
Municipio	Unable to Read or Write	Enrolled in School	Illiterate	With Sixth Grade or Less Education	Illiterate	With Sixth Grade or Less Education
Matamoros	15.6	68.7	4.5	53.4	19.1	71.9
Río Bravo	15.7	69.3	6.7	60.6	23.9	75.6
Reynosa	13.5	70.2	4.7	54.4	18.7	72.5
Nuevo Laredo	14.0	69.6	4.7	53.4	15.8	71.6
Piedras Negras	13.7	62.4	3.3	51.8	13.5	71.9
Acuña	16.1	67.8	4.5	62.7	16.3	77.7
Juarez	16.4	72.4	3.3	54.1	12.6	71.7
Agua Prieta	21.4	72.7	3.3	61.4	12.3	79.5
Nogales	16.8	69.5	1.5	49.6	9.4	71.6
San Luís Río Col.	18.1	70.5	5.0	56.5	18.9	78.3
Mexicali	14.9	68.7	4.0	41.4	16.3	69.3
Tijuana	16.5	71.1	3.9	48.4	14.2	64.5
Total 12 Municipios	15.6	69.9	3.8	50.8	15.6	70.6

Source: Censo de México, 1980.

TABLE 2.11

ECONOMIC STATUS, PRINCIPAL BORDER MUNICIPIOS, 1980

Municipio	Percent of Age Group Economically Active 15-44	45+	Percent* Earning 6,610 or Less Pesos+ Per Month
Matamoros	62.3	52.2	73.2
Río Bravo	54.5	53.9	80.3
Reynosa	55.3	50.8	66.6
Nuevo Laredo	55.4	47.9	73.4
Piedras Negras	57.2	46.0	70.4
Acuña	62.9	51.3	80.0
Juarez	62.8	51.0	76.3
Agua Prieta	67.6	49.7	79.4
Nogales	67.5	49.0	72.6
San Luís Río Col.	52.6	55.4	68.9
Mexicali	55.8	53.4	63.0
Tijuana	60.0	52.7	65.3
Total 12 Municipios	59.1	51.7	70.2

TABLE 2.11 (Cont.)

	Percent of Economically Active Population				Employed in Selected Sectors		
Municipios	Agriculture	Manufacturing	Construction	Trade*	Community Service	Not Specified	All Others
Matamoros	11.0	17.7	6.7	12.0	15.6	30.0	7.0
Río Bravo	26.3	8.9	5.4	9.6	13.1	30.2	6.5
Reynosa	6.8	15.6	8.2	12.2	16.9	31.2	9.1
Nuevo Laredo	3.7	13.2	7.9	17.1	20.0	28.0	10.1
Piedras Negras	4.5	15.4	7.1	10.6	14.9	38.1	9.4
Acuña	10.8	18.3	7.6	12.6	15.4	29.2	6.1
Juarez	3.1	21.6	6.9	14.2	15.1	30.5	8.6
Agua Prieta	7.2	28.1	5.6	8.7	12.6	31.0	6.8
Nogales	2.3	25.0	4.1	11.0	12.3	31.8	13.5
San Luís Río Col.	20.8	8.9	5.9	14.9	15.7	26.2	7.6
Mexicali	13.5	11.3	5.8	12.2	16.9	32.6	7.7
Tijuana	3.1	16.7	6.4	16.4	16.5	33.8	7.1
Total 12 Municipios	7.6	16.5	6.6	13.7	16.1	31.4	8.1

Source: Censo de México, 1980.

*Percent of economically active population.
+6,610 pesos was about $265 U.S. in 1980.
Excludes individuals who did not give income.

TABLE 2.12

INDUSTRY OF EMPLOYMENT, U.S. BORDER COUNTIES, 1980

County	Number of Employed Persons Ages 16 and Over	Percent in Agriculture, Forestry, Fisheries, Mining	Percent in Construction	Percent in Manufacturing
Cameron	71,401	6.4	7.5	16.0
Hidalgo	96,053	12.8	6.5	11.4
Webb	33,043	6.4	7.3	8.3
Maverick	9,177	10.0	5.6	19.0
Val Verde	10,464	6.8	9.2	9.2
El Paso	167,344	1.5	6.2	19.1
Cochise	39,245	6.0	5.5	8.1
Santa Cruz	10,935	4.5	3.7	12.5
Pima	313,856	5.0	5.9	9.7
Yuma	43,298	14.1	5.9	5.9
Imperial	33,778	18.9	6.0	6.4
San Diego	756,400	2.9	6.4	16.3
Total 12 Counties	1,584,994	4.8	6.3	14.1

TABLE 2.12 (Cont.)

County	Percent in Transportation Comm., Public Utility	Percent in Wholesale, Retail Trade	Percent in Finance, Insur., Real Estate	Percent in Services	Percent in Public Admin.
Cameron	6.7	24.3	4.9	29.0	5.1
Hidalgo	5.5	25.3	3.9	29.1	5.5
Webb	10.2	28.3	4.5	27.6	7.3
Maverick	6.3	21.3	3.2	25.8	8.7
Val Verde	8.0	22.9	4.0	27.4	12.5
El Paso	8.6	22.9	5.6	29.0	7.1
Cochise	5.2	21.0	5.0	31.5	17.7
Santa Cruz	6.7	31.9	3.9	27.6	9.2
Pima	5.4	22.4	6.8	39.2	5.4
Yuma	5.3	24.9	4.4	28.5	10.9
Imperial	7.9	22.4	3.8	27.5	7.2
San Diego	6.3	21.7	7.4	32.5	6.5
Total 12 Counties	6.4	22.6	6.4	32.7	6.7

Source: U.S. Census, 1980.

TABLE 2.13

PERSONS EMPLOYED IN HEALTH SERVICES, U.S. BORDER COUNTIES, 1980

County	Number of Persons in Health Services	Percent of Employed Persons	Percent of Population
Cameron	4,457	6.2	2.1
Hidalgo	4,444	4.6	1.6
Webb	1,651	5.0	1.7
Maverick	544	5.9	1.7
Val Verde	578	5.5	1.6
El Paso	11,157	6.7	2.3
Cochise	2,293	5.8	2.7
Santa Cruz	561	5.1	2.7
Pima	32,216	10.3	6.1
Yuma	2,488	5.7	2.7
Imperial	1,777	5.3	1.9
San Diego	54,173	7.2	2.9
TOTAL			
12 Counties	116,339	7.3	3.0

Source: U.S. Census, 1980.

TABLE 2.14

PERSONS FOREIGN BORN, U.S. BORDER COUNTIES, 1980

County	Percent of Population
Cameron	19.1
Hidalgo	19.9
Webb	21.0
Maverick	37.1
Val Verde	19.3
El Paso	21.0
Cochise	11.1
Santa Cruz	36.0
Pima	6.9
Yuma	14.6
Imperial	25.8
San Diego	12.7
Total	
12 Counties	14.7

Source: U.S. Census, 1980.

TABLE 2.15

PLACE OF BIRTH FOR RESIDENTS OF PRINCIPAL BORDER MUNICIPIOS, 1980

County	Mexico Percent in Same State	Percent in Other State	Percent in Other Country
Matamoros	73.8	22.1	4.0
Río Bravo	70.9	26.7	2.3
Reynosa	65.0	31.6	3.5
Nuevo Laredo	59.5	35.7	4.8
Piedras Negras	81.7	16.2	2.1
Acuña	79.2	18.4	2.5
Juarez	71.9	25.4	2.7
Agua Prieta	85.8	12.2	2.0
Nogales	77.7	20.9	1.4
San Luís Río Col.	60.7	37.3	2.0
Mexicali	60.8	37.8	1.4
Tijuana	46.4	51.6	2.0
Total 12 Municipios	64.1	33.3	2.6

Source: Censo de México, 1980.

Note: Note specifieds (0.9%) are excluded.

TABLE 2.16

HOUSING CHARACTERISTICS, U.S. BORDER COUNTIES, 1980

	Occupied Housing Units		Year Round Units
	Percent Owner Occupied		
County	Spanish Origin	Non-Spanish Origin	Percent Two Rooms or Less
Cameron	61.7	70.4	10.9
Hidalgo	66.9	75.9	11.7
Webb	62.0	62.2	11.4
Maverick	64.8	63.4	12.1
Val Verde	62.0	61.2	7.6
El Paso	57.1	62.1	6.9
Cochise	64.3	67.0	6.0
Santa Cruz	58.9	74.6	7.1
Pima	63.1	66.5	8.5
Yuma	59.3	71.2	12.7
Imperial	50.5	67.9	12.6
San Diego	42.9	56.5	8.2
Total 12 Counties	57.3	60.3	8.7

TABLE 2.16 (Cont.)

Occupied Housing Units

County	Percent With 5 or More Persons	Percent With More Than One Person Per Room	Percent Lacking Some Plumbing For Exclusive Use	Average Number of Persons Per Household	
				1970	1980
Cameron	28.8	23.4	7.9	3.92	3.56
Hidalgo	31.2	25.9	9.6	4.14	3.71
Webb	33.2	26.5	5.5	4.00	3.79
Maverick	37.9	31.2	10.3	4.39	4.05
Val Verde	23.7	16.6	2.4	3.64	3.38
El Paso	23.4	13.0	2.9	3.65	3.32
Cochise	15.3	6.4	1.3	3.16	2.88
Santa Cruz	26.3	16.4	2.5	3.24	3.40
Pima	12.2	5.8	1.2	3.21	2.66
Yuma	16.6	13.4	1.2	3.20	2.94
Imperial	23.0	17.2	2.7	3.52	3.24
San Diego	11.2	5.5	1.1	2.94	2.62
Total 12 Counties	16.0	9.6	2.3	3.23	2.88

Source: U.S. Census, 1970 and 1980.

TABLE 2.17

HOUSING STATUS, PRINCIPAL BORDER MUNICIPIOS, 1980

	Bathroom With Running Water		Electrical Service		
Municipios	Percent of Housing Units	Percent of Population	Percent of Housing Units	Percent of Population	Percent of Housing Units With Two Rooms or Less
Matamoros	52.2	51.3	83.6	82.7	61.1
Río Bravo	37.6	37.0	69.6	69.8	64.4
Reynosa	53.1	51.7	82.9	82.2	52.7
Nuevo Laredo	68.3	66.6	89.4	89.1	55.8
Piedras Negras	63.1	62.8	90.2	89.7	56.2
Acuña	46.6	44.4	85.5	85.5	59.7
Juarez	60.4	60.1	89.5	89.4	51.5
Agua Prieta	52.2	50.6	78.4	77.4	50.9
Nogales	63.8	62.8	89.9	90.2	42.0
San Luís Río Col.	53.9	53.4	86.0	85.8	47.6
Mexicali	55.5	55.0	91.6	91.7	47.2
Tijuana	53.3	51.7	89.1	88.5	47.1
TOTAL					
12 Municipios	56.4	55.4	87.9	87.5	51.4

Source: Censo de México, 1980.

TABLE 2.18

PROJECTED POPULATION OF U.S. BORDER COUNTIES, 1980-2000

	Total Population				Percent Increase	Percent Increase
County	1980	1985	1990	2000	80-85	80-2000
Cameron	211,900	250,300	292,300	378,200	18	31
Hidalgo	286,600	350,000	412,000	543,500	22	90
Webb	100,100	121,300	137,800	170,700	21	71
Maverick	31,800	36,900	43,300	56,200	16	77
Val Verde	36,100	41,100	45,400	53,500	14	48
El Paso	482,300	536,500	586,700	680,300	11	41
Total	1,148,800	1,336,100	1,517,500	1,882,400	16	64
		Age 0-4				
Cameron	22,700	28,400	29,200	29,500	25	30
Hidalgo	31,200	39,900	41,800	43,000	28	38
Webb	10,800	14,000	14,400	13,600	30	26
Maverick	3,400	4,300	4,500	4,500	26	32
Val Verde	3,700	4,500	4,600	4,200	22	14
El Paso	45,400	55,000	54,300	50,200	21	11
Total	117,200	146,100	148,800	145,000	25	24
		Women 15-44				
Cameron	47,300	58,100	69,100	89,400	23	89
Hidalgo	64,300	82,400	98,700	129,400	28	101
Webb	22,600	28,900	33,000	41,400	28	83
Maverick	7,335	9,000	10,700	14,000	23	91
Val Verde	8,224	9,500	10,700	12,300	16	50
El Paso	116,200	131,300	145,600	164,800	13	42
Total	265,959	319,200	367,800	451,300	20	70

Source: David Smith, Ph.D., Center for Health and Manpower Policy Studies, School of Public Health, The University of Texas Health Science Center at Houston (unpublished data).

FIGURE 2.1

POPULATION PYRAMIDS SHOWING AGE AND SEX DISTRIBUTIONS IN PERCENTS FOR THE UNITED STATES, 12 AND 10 BORDER COUNTIES, AND 12 MUNICIPIOS, 1980

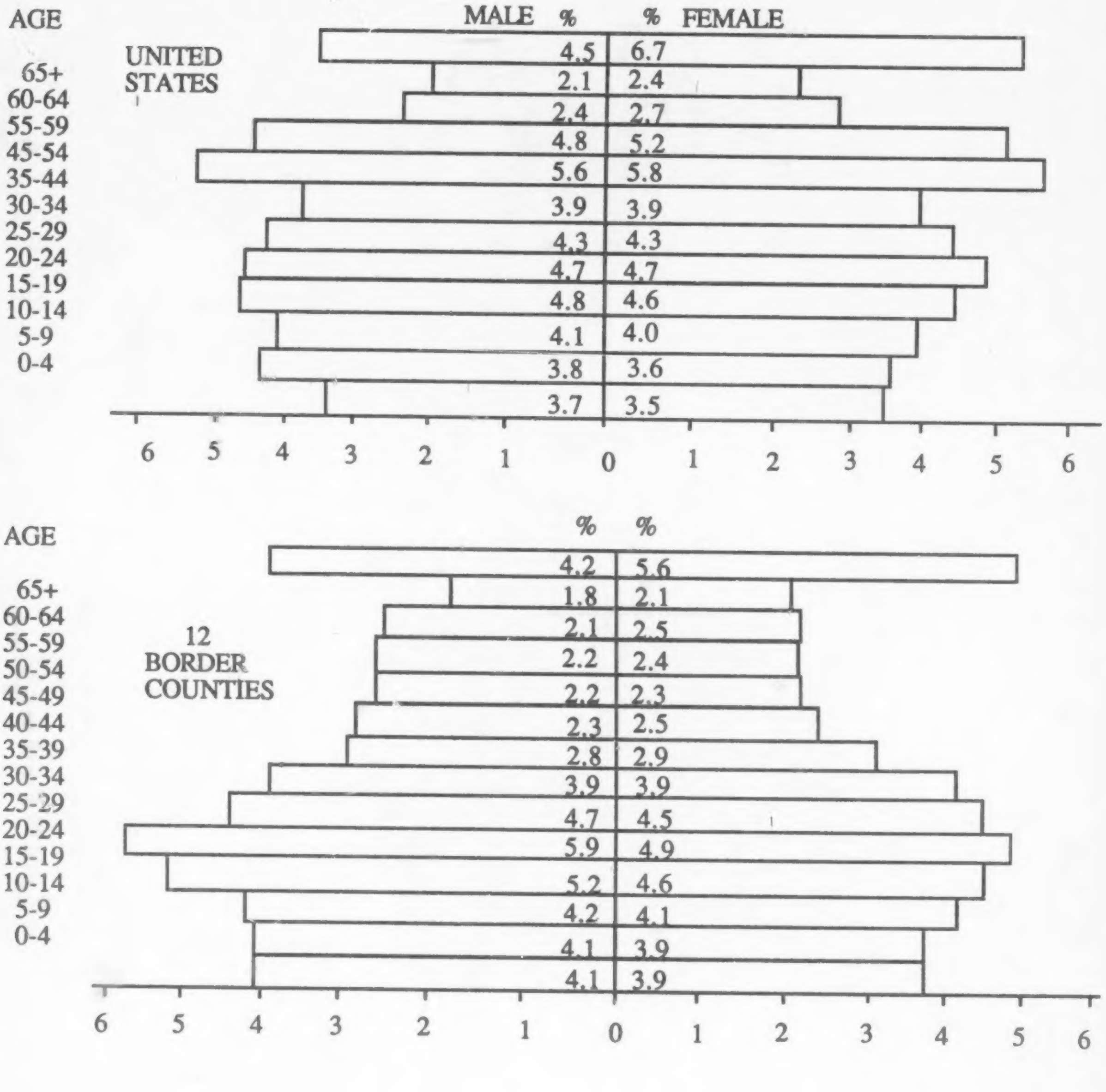
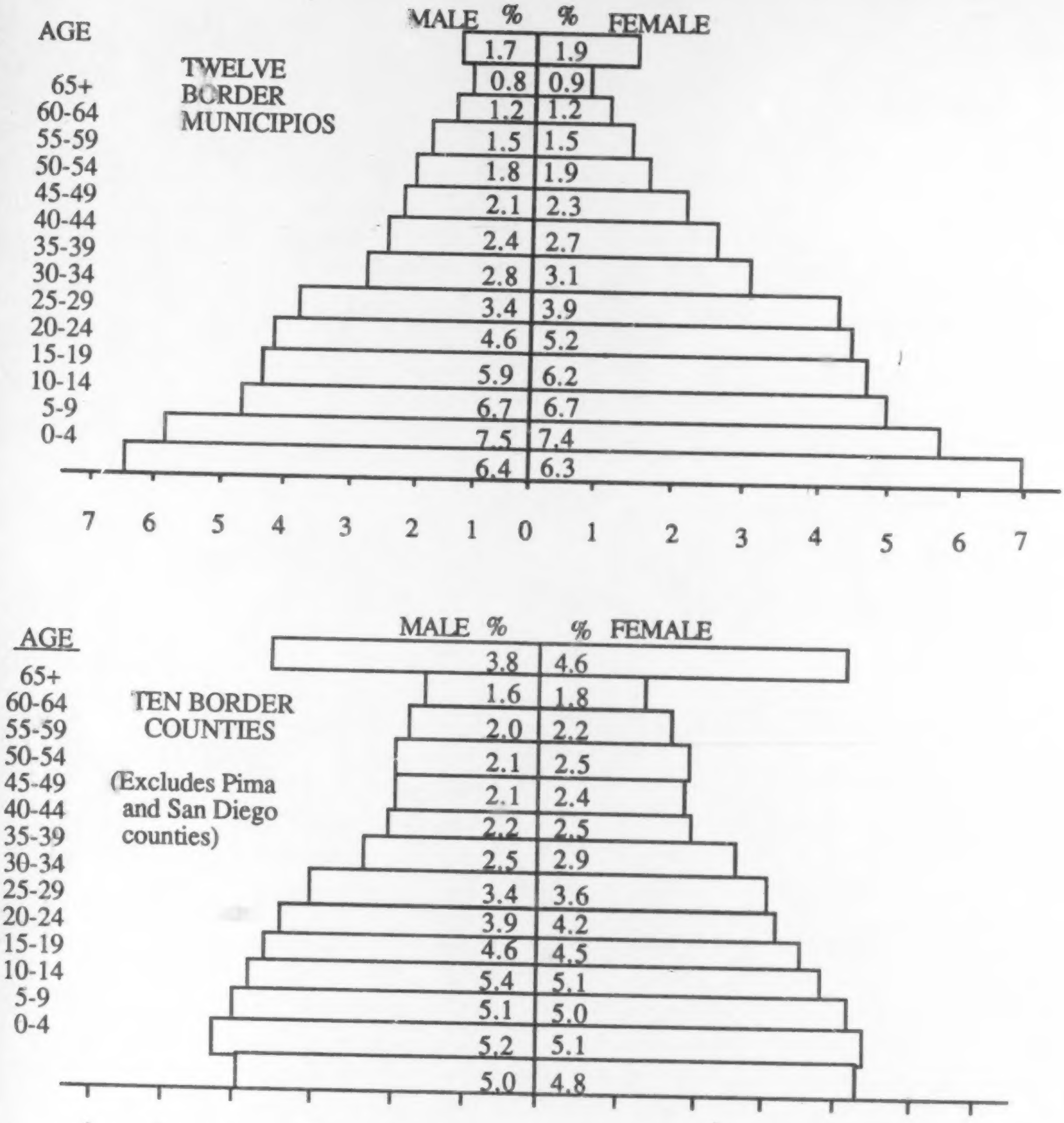


FIGURE 2.1 (Cont.)



*Note: Includes 2,751 (0.1%) Age Unspecified

Sources: Censo de Mexico, 1980.
U.S. Census, 1980.

CHAPTER 3

PATTERNS AND TRENDS IN NATALITY

In this chapter, we examine a number of characteristics of births on the U.S.-Mexico border. As in previous chapters, the basic units of analysis are the 12 principal border counties on the U.S. side and the 12 major border municipios on the Mexican side. Most measures refer to births to residents of the respective counties. However, a few of the variables examine the births occurring in the respective counties. Analysis is limited by a scarcity of fertility data for the municipios and by confusion injected into the data on both sides of the border by migration for birth, false or absent information on birth certificates, the holding of "dual citizenship" (double counting of births), and other problems of data reliability.

Throughout this chapter, we present summaries of natality patterns in the principal U.S. border counties. This information was developed from computer tapes generously provided by the respective state health departments. The analysis generally covers the years 1970 and 1975 through 1980. Supplementary information was gathered from a variety of sources. Some is from the United States or Mexican census, some is provided by health authorities in Mexico, and some is borrowed from individual research conducted by participants in this research project.

3.1 Completed Fertility

In the previous chapter, the authors noted that the number of women of childbearing ages (15-44) as a percentage of the total population in the border counties is not too different from the percentage for the United States as a whole. Women of childbearing age in the municipios constitute a somewhat smaller segment of the total population. These similarities however are quite misleading. Although in the U.S. as a whole 39% of white women of childbearing age were under age 25 in 1980, in the U.S. border counties the percentage was 42%. In the Mexican border municipios the percentage was 48%. Thus, women of childbearing age on the border are younger than their U.S. counterparts. Furthermore, in the Mexican border municipios, women of fertile age constitute a smaller proportion of the population, because such a high percentage of the population is below age 15. This suggests that, depending on the family planning choices of the local population, the future number of births could be very large. In 1980 the average woman of childbearing age in ten of the border counties had given birth to one and a half times as many children as their U.S. national counterparts despite the fact that the border women were younger. Pima County, Arizona, and San Diego County, California, in comparison to the rest of the border, have large, predominantly Anglo, populations and have well-developed economies. These two counties had average-children-born figures somewhat lower than those for United States.

On the Mexican side of the border, the average number of children born to women of childbearing age was almost twice as high as the figure for the United States as a whole and one and a half times the figures for the U.S.

border counties.

The historical aspects of childbearing are evaluated by examination of completed fertility measured as the ratio of the total number of children ever born to women ages 35-44 to the total population of women of the same age (table 3.1). By this measure, completed fertility in Imperial County, California, and each of the six Texas counties was quite high in comparison to the United States average. Completed fertility declined in all of the principal border counties over the prior decade. However, those counties with the highest averages in 1970 did not experience the largest decreases in completed fertility. Cameron, Hidalgo, Webb, and Maverick counties, all in Texas, had the highest levels of completed fertility in 1970; continue to have high levels in 1980; and except for the very small Maverick County population, did not experience the substantial decreases seen in the Arizona counties.

3.2 Crude Birth Rates

While historical aspects of childbirth are measured in terms of completed fertility, contemporary aspects can be measured most simply by the crude birth rate, that is, the number of live births to residents per 1,000 population in a given year. Figure 3.1 includes a series of schematic diagrams (boxplots) depicting the distribution of crude birth rates for residents of the 12 U.S. border counties for the years 1970 and 1975 through 1980. Boxplots serve as convenient devices for summarizing batches of data. As adapted here, the extreme ends (marked by "x's") on any given boxplot represent the highest and lowest rates (read off the vertical axis) among the 12 key border counties. The top and bottom edges of the "box" mark the values associated with the upper and lower quartiles (50% of the 12 indicators lie between these values).[1] The crossbar represents the value associated with the median, or most typical, observation. With fertility measured as total number of live births by residents per 1000 population, the first boxplot in figure 3.1, for example, indicates that the highest birth rate among the 12 counties in 1970 was 31.6 per 1,000 population in Yuma County (table 3.2). The lowest birth rate in 1970 was 18.1 per 1,000 population in San Diego County. The median county[2] had 24.7 resident live births per 1,000 population in 1970. One half of the border counties had crude birthrates falling between an upper quartile of 30.8 (Webb County) and a lower quartile of 20.9 (Imperial County).

It is apparent from the trend in median border-county crude birth rates (the path that the crossbars take moving across the years) in figure 3.1 that there has been a perceptible decline in birth rates over the decade for the 12 principal border counties as a whole. The figure also illustrates that a great deal of the decline occurred between 1970 and 1975. The median trend for

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[1] Actually, in this study of 12 counties, the upper quartile is calculated to be the average of the third and fourth highest values; the lower quartile the average of the third and fourth lowest values.

[2] When there is an even number of observations, the median value is calculated as the average of the two middle values. As a consequence, the value for the "median county" does not refer to a value actually observed in one of the 12 counties.

1975 through 1980, however, is slightly positive. Thus, birth rates declined significantly from 1970 to 1975 and appear to have increased slightly between 1975 to 1980. Such a pattern is not inconsistent with the pattern for the U.S. as a whole.

The "spread" of the boxplots has diminished from 1970 to 1980, providing evidence that crude birth rates have evened out along the border. Nevertheless, the median rate for key border counties remains significantly higher than the rate for the United States as a whole. From 1970 to 1980, the median crude birth rate among the border counties dropped 11% to 22.0 per 1,000 population. This contrasts with a 14% decline from 18.4 to 15.8 for the United States as a whole over the same period. Although crude birth rates remain high along the border compared to national figures, the trend along the border is in the direction of lower rates.

Table 3.2 examines trends in resident crude birth rates for 1970 and 1975 through 1980 in the individual counties. The multi-year trend for any given county is summarized by the sign of the slope coefficient derived from a simple linear regression of the crude birth rate for that county against time. The statistical significance attached to the sign of the trend -- with a conventional cutoff adopted at 90% significance -- is shown in the final column of the table. Thus, we can see that despite the downward (negative) trend in the birth rate for San Diego County, this trend was not significantly different from a trend line with zero slope, that is, the absence of any trend at all over time. The raw data on which the analyses in figure 3.1 and table 3.2 are based can be found in appendix A.

The most atypical result in the regression analysis is the birth rate trend in Santa Cruz County, Arizona. Santa Cruz is the only one of the 12 counties having a statistically significant positive trend in the birth rate over the decade. This result may be attributed to the unreliability of a small sample size with only seven years of data for a small population. Santa Cruz County, with most of its population located in the city of Nogales, ranks twelfth in population among the 12 principal border counties.

State-level data for Mexico, as displayed in table 3.3, convey a rough idea of the order of magnitude of crude birth rates on the Mexican side of the border. These rates are substantially higher than on the U.S. side, and there has been a large decline in birth rates over the decade. The lowest reported birth rate for a Mexican border state over the years studied exceeds the highest birth rate observed for any of the U.S. border counties.

The median birth rate for Mexican border states in 1978, 37.0 births per 1,000 population, was slightly below the Mexican national figure for the same period, and results from a 15% decline from the median rate for 1970. This percentage decline exceeds the 12% decrease for Mexico as a whole as well as the 11% decline for the median U.S. border county over the decade.

The authors located counts of births for the municipios. However, they are not presented here because of concern about their reliability. Rates calculated by the data source[3] for the years 1971 and 1974 show crude birth rates in the municipios ranging from 35.0 to 46.3 per 1,000 population. These figures are generally lower than the corresponding data for the Mexican border states, but nonetheless seem reasonable. Figures located for 1978 for the municipios suggest that birth rates in the municipios plunged to the 14.0 to 29.0 range, and these figures do not seem reasonable. One explanation of this result is that many people in Mexico, especially in remote areas, might not register their children until some time after the birth. Thus, figures which have aged some years, and have been annually amended to include late registrations, would tend to be more accurate than recent birth data. Alternatively, the authors may have erred at the point of data collection.

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[3] Dra. Maria Angelica Vargas Perez, "Situacion de Salud de la Poblacion en la Frontera Mexico/Estados Unidos y Algunas Alternativas de Solucion," 1978 (unpublished paper).

There is evidence that the number of births on the U.S. side of the border, especially in Cameron, Hidalgo and Webb counties, may be artificially inflated. This would result if Mexican nationals giving birth in the U.S. falsely declare themselves on birth certificates to be residents of U.S. border counties.[4] This hypothesis is supported by the work of a participant in this research project, Alfonso Ortiz.[5] Mr. Ortiz, on examination of 567 infant deaths which occurred in Nuevo Laredo, Mexico, noted that ten cases showed Laredo, Texas, or other U.S. locations as the place of birth. While the number of births counted in the counties is probably inflated, it is not clear whether the count of births on the Mexican side of the border is correspondingly deflated. When the mothers return to Mexico, some might obtain birth certificates on that side of the border, resulting in "dual citizenship" for the child.

Despite data problems, we can conclude that crude birth rates in most border counties are high. On the Mexican side of the border, they are very high. Although birth rates have decreased over the previous decade, given the large numbers of children on both sides of the border, augmented by northward migration from Mexico's interior, we can conclude that annual number of births along the border will continue to increase into the foreseeable future.

3.3 Fertility Rates

The crude birth rates presented in the previous section reflect the number of live births in relation to total population for a given year. A fertility rate reflects the number of live births in a given year in relation to women "at risk", that is, women of childbearing age (15-44).

In 1970, the United States as a whole experienced 87.9 resident live births per 1,000 women aged 15-44 (table 3.4). San Diego and Pima counties had slightly higher rates. The remaining counties, especially the Texas counties, had much higher rates. By 1980, the U.S. rate had decreased by 22% to 68.4 per 1,000. With the exception of Imperial County, the rates for the border counties all decreased. Some decreases were less substantial than the national decrease. Some were greater. Rates for Imperial, Santa Cruz, and five of the Texas counties still exceed 100 per 1,000.

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[4] Eve Powell-Griner and Dan Streck, "A Closer Examination of Neonatal Mortality Rates Among the Texas Spanish Surname Population," American Journal of Public Health, 72 (9) (September 1982), p. 993; Donna A. Barnes, "Methodological Issues in Assessing the Relationship Between Infant Mortality and Socio-Economic Status" (Masters Thesis, The University of Texas at Austin, Department of Sociology, 1978), p. 22.

[5] Alfonso Ortiz, Comparative Study of Infant Mortality in Texas/Mexico Border Area of Laredo/Nuevo Laredo, Working Paper No. 29 (Lyndon B. Johnson School of Public Affairs, The University of Texas at Austin, 1984).

3.4 Age-Specific Fertility

Table 3.5 presents age-specific fertility rates for the border counties for the years 1970 and 1980. In 1970, the United States experienced 40.8 births to resident women under age 18 per 1,000 women ages 15-17. By 1980, this figure had fallen to 34.2 per 1,000. Along the border in 1970, the teenage fertility rate was generally lower than the national rate. By 1980, rates for seven of the counties exceeded the national rate, and rates for half of the counties exceeded 40 per 1,000. Rates were particularly high in most of the Texas counties, Yuma County, and Imperial County. Given the potential problem of inaccurate recording of residence on birth certificates, we cannot conclude with certainty that teenage fertility has increased. Further study of teen fertility on the border is warranted because of its potential for increasing demand for public health and social services as well as immediate concern for the welfare of the mothers and their infants.

Among the 18-34 age group, fertility rates have decreased substantially in all but one of the border counties. However, rates are still very high. Seven of the counties had fertility rates in 1980 above 150 per 1,000 women aged 18-34, compared to a national rate of 96 per 1,000. Rates for the 35-44 age group also have decreased. However, rates for 1980 for women aged 35-44 in Hidalgo, Cameron, and Webb counties are more than three times the national rate.

The high rates for Hidalgo and Cameron counties are particularly troubling because the data tapes for these areas contain a substantial number of cases where the mothers' ages are not known. Thus, age-specific fertility rates are, on the average, understated by about 3% in these counties. It is not known whether the individuals concentrate in one age group more than the others. For example, if all of the unknowns in Hidalgo County happened to be teenagers (ages 15-17), then the rates for that group would be 58% higher than shown in table 3.5. On the other hand, an unknown number of women from Mexico give birth in the United States and artificially inflate birth rates as well as general and age-specific fertility rates by indicating U.S. residence on birth certificates. The effects of this group on age-specific fertility calculations are not clear.

3.5 Age of Mothers

Table 3.6 presents total resident births for each of the 12 principal border counties and percent distribution by age of mother for the years 1970 and 1980. The numbers of "age unknown" are large enough in Hidalgo, Cameron and Imperial counties to undermine analysis of the data. Perhaps these large numbers result from undocumented immigrants who are afraid to give information for fear that authorities may check on the mother's legal status. Alternatively these "unknowns" might reflect women who crossed the border solely for childbirth.

Most noticeable is a downward trend in the percentage of births to mothers ages 35 and older in every one of the border counties. The greatest decreases have been in the Texas counties of Maverick, Webb, Hidalgo, and Cameron, as well as in Santa Cruz County and Imperial County. However, each of these counties exceeds the national figure of 4.6% of births occurring to women ages 35 and older.

The percentage of births to women ages 18-34 increased in all but one county. Seven of the counties show increases in the percentage of births to women under age 18, although the effects of the large numbers of "age unknown" are unclear. In general, the counties showing increased proportions in teenage births are those with the greatest poverty, namely, Imperial County, Santa Cruz County and five of the six Texas counties.

3.6 Parity of Mothers

Parity refers to the number of children previously born alive. For women giving birth in the border counties, table 3.7 indicates that parity is unknown for about one-third of the mothers giving birth in the Texas counties. Also, there is a clear downward trend in the percentage of women giving birth who have already borne four or more children. The only exception to this trend occurs in San Diego County, where the percentage of mothers in this group was already low in 1970. However, in the United States, only 4.3% of the births in 1980 were to women who already had four or more children. In nine of the border counties, more than 7% of the women giving birth had borne four or more children. As a result, first order births in the border counties are not as common as they are elsewhere in the country. Because parity is unknown for such a large share of the Texas births, we are uncertain of the reliability of Texas data. Whether this outcome reflects researcher error in abstracting birth record data from the computer tapes or whether it is evidence of a reporting problem in the state remains to be investigated.

Further light is shed on parity by the work of Eve Powell-Griner,[6] a participant in this research project. She separated births occurring in 15 Texas counties adjacent to the border in the year 1980 according to residence (Texas or Mexico) and ethnicity (Anglo or Spanish surname). Table 3.8 indicates that just over half of the births in the border counties were to women with one to three prior births. This was so regardless of place of residence or ethnicity. Among Texas residents the Spanish surname women were much less likely to be nulliparous, and were two and one-half times as likely to have had four or more births. The births to Spanish surname women from Mexico were similar to the births to Texas Spanish surname residents. However, the presence of very high parities (eight or more prior births) was more pronounced. The identification of 277 cases reported as Anglo residents of Mexico introduces some confusion, especially since the distribution for those women is more similar to the Anglo Texas residents than to the other Mexican residents.

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[6] Eve Powell-Griner, Characteristics of Births in Two Areas of Texas: 1980, Working Paper No. 21 (Austin: Lyndon B. Johnson School of Public Affairs, The University of Texas at Austin, 1983).

3.7 Low Birth Weight

Low birth weight infants may be either premature or full-term but small for their gestational age. The value of a summary statistic for low birth weight relates to findings from numerous studies linking low birth weights with elevated rates of infant mortality, as well as with various physical and neurological impairments. Low birth weight is generally defined as an infant's weight at birth of under five and one-half pounds (2,500 grams).

The boxplots in figure 3.2 indicate that there has been relatively little overall change in the proportion of births that were underweight in the border counties over the decade 1970-1980. Compared with the overall figure for the United States (table 3.9), the percentage of babies that were underweight in border counties is low, especially in the counties with large Hispanic populations. When comparison is made with U.S. Anglo babies, the figures for the border counties are found to be more similar to the national indicator.

Table 3.9 examines birth weight trends based on a simple linear regression model that captures the trend in the proportion of births that were underweight in each of the 12 counties. The only statistically significant trends are downward (negative) and, of these, only Cameron County had a sufficient number of cases to be free from small sample bias. The rate of low birth weight in Cameron County dropped from 6.1% in 1970 to 4.8% in 1980.

Table 3.10 examines births occurring in 15 Texas border counties and substantiates findings from the previous table. When the mother reports Texas residence, the proportion of newborns having low birth weights is lower among Spanish surname individuals than among Anglos. When Mexico is reported as the place of residence, the proportion is even lower.

3.8 Prenatal Care

Table 3.11 shows, for the years 1970 and 1980, for each county the percentage of resident births without prenatal care, and the percentage of births with an "unknown" response to the question of prenatal care. For those indicating some prenatal care, a percentage distribution shows trimester of initial service. Data were not located for the four Arizona counties for 1970. Also, the large numbers of "unknowns" for Webb and other counties in both 1970 and 1980 should be noted because their presence introduces substantial uncertainty. Finally, the reader should observe that these data do not reflect the total number of prenatal visits a mother might have made, nor the nature of the visit, nor even the definition of a "visit". For example, a mother might report a pregnancy test as a prenatal visit, giving the impression that early and continuing care was received when, in fact, it was not.

Women from those counties with the greatest Hispanic populations were more likely to postpone prenatal care until the third trimester. In El Paso County and perhaps Cameron County, the situation appears to have deteriorated. The increase in late prenatal care in Val Verde County probably reflects the small number of births rather than a consistent trend.

The boxplots in figure 3.3 provide evidence that a higher proportion of mothers obtained access to prenatal care. That the boxes also shrink over time indicates that the principal border counties converged toward a more uniform and lower proportion of births without prenatal care. The results of linear regression analyses of proportions over time for eight of the counties for the years 1970 and 1975 through 1980 are displayed in table 3.12. A significant negative trend in failure to obtain prenatal care is evident in six of the eight counties. The positive trend in San Diego, the county with the best utilization, is insignificant.

Figure 3.4 portrays prenatal care along the border from a slightly different perspective. Each boxplot depicts the spread of average starting times for prenatal care in the principal border counties for each of the indicated years. Clearly, the trend has been toward earlier prenatal care along the border. Also, the counties appear to become more uniform by this measure. Summary statistics from simple regression of the averages over time for eight of the border counties are displayed in table 3.13. In six of the counties, the trend is toward earlier care. In three counties, the trend is significant. The data for Val Verde and Maverick counties suffer from unreliability because of small numbers of births in these counties.

Table 3.14 was constructed to evaluate the high percentage of "unknown" responses to the prenatal care question on the birth certificates in the Texas counties, particularly Webb County. There is no statistical evidence to support the conclusion that "prenatal care unknown" responses are becoming more or less common. However, it is striking that lack of response is so common in the Texas counties. Data on prenatal care and low birth weight are provided in appendix B.

3.9 Birth Attendant and Location

Table 3.15 shows attendant and location for births occurring in fifteen Texas border counties compared to the balance of Texas. The border county data are disaggregated by the mother's ethnicity and place of residence. Births on the border are much less likely to take place in a hospital or to be physician attended than births elsewhere in Texas. Spanish-surnamed Texas residents on the border are much less likely than Anglo Texas border residents to use physicians or hospitals. Residents of Mexico giving birth in Texas border counties are even less likely to do so.

The table does not distinguish between certified nurse midwives and lay midwives. However, during the years examined, the great majority of midwives on the border were known to be lay midwives. The extensive use of midwives by women from Mexico, along with a tendency of these women to give birth in "other" locations, indicates that a large portion of lay midwife services were provided to women from Mexico.

The issue of midwives on the border has been troubling. Lay midwives may or may not be trained. In El Paso, for example, there is a lay midwife training program and lay midwives in that city are required to pass an examination and be registered with local authorities. Su Clinica Familiar and the Brownsville Community Health Center, both in Cameron County, use nurse midwives under supervision. In Brownsville, lay midwives are required to take an examination. However in Cameron, Hidalgo and, to a lesser extent, Webb counties, a number of independent parteras provide the birthing services. A partera (one who parts) is an indigenous, lay midwife. Relatively little is known of their training or effectiveness, and their presence on the Texas portion of the border (they are rare in other border states) has been a source of heated debate.

Philpott[7] developed a profile of 32 parteras active in the Lower Rio Grande Valley from interviews collected by A. Hurtado[8] in 1977. Eleven were uneducated and four had completed high school or beyond. Of these, one was a registered nurse and another had two years of medical school in Mexico. Their average age was over 60 years old, ranging from 38 to 80 years old, and they had an average of 30 years in practice. Many came from families with three to four generations of parteras. Hurtado rated 30 of their homes as: beautiful (5), very nice (10), nice (5), and not nice (10). One had an apartment. The average cost for a partera delivery was $175 in 1977. Rachel Spector[9] reports costs ranging from $185 to $300 in 1982. Of the 32 parteras in 1977, 21 stated that they refer emergencies to the hospital, and eleven, to a physician.

In 1976, there were 39 lay midwives in Cameron County, of whom 30 were in Brownsville. Another 31 could be found in Hidalgo County. In 1977, the City of Brownsville passed an ordinance requiring that lay midwives must pass an examination to practice within the city limits. Several midwives were unable to pass the new requirements and moved outside the city limits.[10] The result was that, where lay midwives had been attending 67% to 80% of the births occurring in Brownsville (table 3.16), their share dropped to 44% in 1978. In the same year, midwife-attended births jumped from 5% to 43% of births occurring in rural areas of Cameron County. The midwives and their clients had migrated out of the city and, as a result, the clients perhaps had less access to hospital or other emergency support. An irony of the situation is that, when Brownsville and the rural areas of the county are viewed as a whole, the total number of births occurring in the area had already been declining directly as a result of decreased midwife activity. The overall number of physician and nurse-midwife attended births stayed fairly constant over the years. In 1979, the number of births attended by physicians and the number attended by lay midwives both increased sharply. The midwife deliveries increased again in 1980, while the physician deliveries stayed constant.

Table 3.17 indicates that, through 1976, teenagers constituted about 15% of the practices of both the physician deliveries and the lay midwife deliveries in the combined Brownsville/rural Cameron County area. After 1976, teen births dropped to about 12% of physician deliveries. However, lay midwives continued to serve teenagers in proportions similar to the earlier years.

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[7] L.L. Philpott, A Descriptive Study of Birth Practices and Midwifery in the Lower Rio Grande Valley of Texas -- A Dissertation (School of Public Health, The University of Texas Health Science Center at Houston, 1979).

[8] A. Hurtado, "Interviews with Parteras," transcripts and tapes available at Pan American University, 1977.

[9] Rachel E. Spector, The Utilization of Parteras as a Source of Maternal/Child Health Care Along the U.S./Mexico Border, Working Paper No. 23 (Austin: Lyndon B. Johnson School of Public Affairs, The University of Texas at Austin, 1983).

[10] Ibid.

Midwife deliveries accounted for 19% of the births to Cameron County residents in 1980 (table 3.18). In Hidalgo, Webb, and El Paso counties, midwife deliveries accounted for fewer, but still substantial shares of resident births. On the other hand, the midwife deliveries occurring in each county far outnumbered those among residents. Some of the 2,300 additional births can be explained by travel from neighboring counties, but most are births to Mexico's residents.

3.10 Summary

Natality patterns along the border are substantially different from those of the nation as a whole. Completed fertility is higher, as are crude birth rates and age-specific fertility rates especially among older women. Although little is known about natality patterns in the municipios, crude birth rates for Mexico's border states are very high.

Pregnant women in the border counties are less likely to obtain prenatal care and, when they do so, are more likely to obtain care late in their pregnancies. Their births are often attended by lay midwives. High fertility and inadequate prenatal and delivery care are most common in those counties with relatively large Hispanic populations. Despite adverse economic conditions and inadequate prenatal care, birth weights appear to be similar to those among U.S. Anglo newborns.

By virtually every measure, birthing conditions improved over the last decade. Levels of fertility have declined. The population makes greater and earlier use of prenatal care. Birth attendants are more likely to have medical training. Low birth weight is less common. On the other hand, there is some evidence that fertility among teens increased. Also, after 1978, lay midwives became more active.

Despite overall improvements in the border counties, conditions in Imperial, Santa Cruz, and the six Texas counties still lag far behind those in the rest of the nation. In particular, Hidalgo and Cameron counties in the Lower Rio Grande Valley present problems in terms of large numbers of out-of-hospital births, late or no prenatal care, high parity, and larger numbers of teen pregnancies.

TABLE 3.1

TOTAL AND AVERAGE NUMBER OF CHILDREN EVER BORN TO WOMEN AGED 35-44 YEARS: 1970 AND 1980

County of Residence	Total Ever Born 1970	Total Ever Born 1980	Average Number 1970	Average Number 1980	Percent Change in Average
Cameron	34,643	40,652	4.19	3.70	-11.7
Hidalgo	46,227	53,960	4.49	3.80	-15.3
Webb	16,433	18,562	4.00	3.60	-9.9
Maverick	5,024	6,501	4.76	3.80	-20.2
Val Verde	5,501	6,715	3.58	3.40	-5.0
El Paso	80,624	86,496	3.55	3.20	-9.9
Cochise	12,204	13,334	3.47	2.70	-22.2
Santa Cruz	3,112	3,096	3.50	2.60	-25.5
Pima	59,881	68,995	3.07	2.39	-22.0
Yuma	11,645	11,802	3.48	2.47	-29.0
Imperial	17,045	16,506	3.84	3.37	-12.2
San Diego	215,206	252,860	2.85	2.49	-12.6
Median County			3.57	3.29	-7.8
U.S.	--	--	2.96	2.72	-8.1

Source: U.S. Census, Social and Economic Indicators, 1970 and 1980.

TABLE 3.2

SIMPLE LINEAR TREND ANALYSIS OF CRUDE BIRTHRATES OVER TIME IN U.S BORDER COUNTIES: YEARS 1970, 1975-1980

County	Initial Rate 1970	Final Rate 1980	Sign of Trend*	Statistically Significant at 90% Confidence?*
Cameron	29.3	26.2	Negative	No
Hidalgo	31.2	23.4	Negative	Yes
Webb	30.8	26.6	Negative	Yes
Maverick	23.7	26.9	Positive	No
Val Verde	30.7	24.3	Negative	Yes
El Paso	25.8	20.7	Negative	Yes
Cochise	21.8	18.3	Negative	Yes
Santa Cruz	21.3	24.4	Positive	Yes
Pima	19.2	16.8	Negative	Yes
Yuman	31.6	19.8	Negative	Yes
Imperial	20.9	24.0	Positive	No
San Diego	18.1	16.6	Negative	No
Median County	24.7	22.0	--	--
U.S.	18.4	15.9	--	--

Source: Vital statistics tapes from the Arizona, California, New Mexico, and Texas state health departments; U.S. Census, 1970 and 1980.

* Test of data for 1970 and 1975 through 1980.

TABLE 3.3

CRUDE BIRTHRATES FOR MEXICAN BORDER STATES: BIRTHS PER 1,000 POPULATION, SELECTED YEARS

State	1970	1971	1974	1975	1976	1978*
Tamaulipas						
Number	58,376	59,108	69,951	61,078	58,319	--
Rate	39.5	38.8	42.2	35.9	33.4	33.2
Nuevo León						
Number	75,054	80,309	92,499	86,886	81,938	--
Rate	43.5	44.6	45.8	41.5	37.8	37.4
Coahuila						
Number	57,349	62,143	62,708	60,838	58,314	--
Rate	51.1	53.3	48.4	45.4	42.1	44.3
Chihuahua						
Number	66,792	69,155	76,760	70,946	68,399	--
Rate	41.0	41.7	43.8	39.8	37.7	36.7
Sonora						
Number	51,311	52,095	55,491	53,793	53,124	--
Rate	46.1	45.3	43.8	41.2	39.5	38.7
Baja California N.						
Number	38,461	40,078	43,079	40,995	38,921	--
Rate	43.3	43.5	42.1	38.8	36.7	34.3
Mexico						
Rate	43.5	43.9	46.3	41.8	39.2	38.4

Sources: Censo de México, 1970.
CONAPO, Mexico Demográfico, Breviario, 1971.
SPP, Manual de Estadísticas Básicas, 1979.
SSA, Compendio de Estadísticas Vitales de Mexico, 1976.
SSA, Estadistícas Vitales, 1974 and 1975.
SSA, Estadistícas Vitales, Demográficas y de Recursos en la Republica Mexicana, 1969-1973.

* Rates for 1978 calculated by source. Remaining rates calculated by authors. Raw data collected for 1977 and 1978 were much lower (10,000-25,000) than birth counts in prior years, and were therefore disregarded.

TABLE 3.4

FERTILITY RATES, 1970 AND 1980
U.S. BORDER COUNTIES
RESIDENT LIVE BIRTHS PER 1,000 WOMEN AGED 15-44

	1970			1980			
County	Women 15-44	Live Births	Rate/1000	Women 15-44	Live Births	Rate/1000	Percent Change in Rates
Cameron	29,797	4,044	135.7	46,720	5,490	117.5	-13.4
Hidalgo	38,573	5,808	150.6	63,697	7,626	119.7	-20.5
Webb	15,389	2,410	156.6	22,578	2,643	117.1	-25.2
Maverick	3,885	490	126.1	7,306	845	115.7	-8.2
Val Verde	6,026	872	144.7	8,171	873	106.8	-26.2
El Paso	81,299	9,334	114.8	115,501	9,918	85.9	-25.2
Cochise	12,477	1,386	111.1	18,874	1,520	80.5	-27.5
Santa Cruz	2,979	330	110.8	4,577	482	105.3	-5.0
Pima	73,547	6,726	91.5	126,312	8,978	71.1	-22.3
Yuma	13,630	1,490	109.3	19,091	1,824	95.5	-12.6
Imperial	15,460	1,650	106.7	20,920	2,266	108.3	+1.5
San Diego	278,347	24,638	88.5	437,737	30,979	70.7	-20.1
TOTAL							
U.S.			87.9			68.4	-22.2

Sources: National Center for Health Statistics, Vital Statistics of the United States, 1980, Natality.
U.S. Census, 1970 and 1980.

Notes: Live birth figures represent total resident live births regardless of mother's age. Nationally reported counts differ slightly from counts obtained directly from the respective state data tapes.

TABLE 3.5

AGE-SPECIFIC FERTILITY RATES
RESIDENT LIVE BIRTHS PER 1,000 WOMEN IN AGE GROUP
U.S. BORDER COUNTIES, 1970 AND 1980

	Ages 15-17				Ages 18-34				Ages 35-44			
	Births*		Rate		Births		Rate		Births*		Rate	
County	1970	1980	1970	1980	1970	1980	1970	1980	1970	1980	1970	1980
Cameron	199	322	38.0	48.2	3,018	4,547	185.3	156.5	467	462	56.5	42.0
Hidalgo	265	429	38.8	46.2	4,558	6,304	209.2	156.8	697	639	67.6	45.0
Webb	81	150	34.1	43.9	1,886	2,279	211.8	162.7	280	214	68.1	41.5
Maverick	22	40	31.3	33.8	351	748	165.1	169.5	55	56	52.1	32.7
Val Verde	31	46	36.4	42.9	759	774	208.7	151.1	54	51	35.1	25.8
El Paso	474	509	40.0	34.1	7,944	8,778	170.0	119.4	848	579	37.3	21.4
Cochise	68	53	37.4	21.3	1,187	1,418	166.1	123.9	96	79	27.3	16.0
Santa Cruz	10	21	19.8	32.1	247	452	156.0	165.4	40	26	44.9	21.9
Pima	380	496	37.9	37.2	5,924	8,012	134.6	95.2	430	424	22.0	14.7
Yuma	130	105	70.0	44.8	1,717	1,609	244.7	134.5	77	78	23.0	16.3
Imperial	82	130	31.9	41.4	1,325	1,943	156.8	150.9	150	132	33.8	26.9
San Diego	1,287	1,202	37.1	27.2	21,883	28,252	130.2	96.7	1,397	1,472	18.5	14.5
U.S.			40.8	34.2			131.5	96.2			19.7	12.6

Sources: Birth tapes of respective state health departments.
NCHS, Vital Statistics of the United States, vol. 1, Natality, 1970 and 1980.
U.S. Census, 1970 and 1980.

* Births to women ages 15-17 includes some births to younger women.
Births to women ages 35-44 includes some births to older women.
United States data are recomputed to maintain comparability.
Note that unknown ages are excluded from calculations.
State birth tapes tend to count fewer births than are reported in national publications.

TABLE 3.6

PERCENTAGE DISTRIBUTION OF RESIDENT BIRTHS BY AGE OF MOTHER, U.S. BORDER COUNTIES, 1970 AND 1980

	Percent Ages ≤ 18		Percent Ages 18-34		Percent Ages 35+		Age Unknown		Total Births	
County	1970	1980	1970	1980	1970	1980	1970	1980	1970	1980
Cameron	5.7	6.0	82.2	85.3	12.1	8.7	311	158	4,115	5,489
Hidalgo	4.8	5.8	82.6	85.5	12.6	8.7	150	242	5,669	7,614
Webb	3.6	5.7	83.9	86.2	12.5	8.1	34	0	2,281	2,643
Maverick	5.1	4.7	82.5	88.6	12.4	6.6	24	0	452	844
Val Verde	3.9	5.3	89.7	88.9	6.4	5.9	31	0	875	871
El Paso	5.1	5.2	85.7	88.9	9.2	5.9	9	49	9,275	9,915
Cochise	5.0	4.6	87.9	90.3	7.1	5.0	0	0	1,351	1,570
Santa Cruz	3.4	4.2	83.2	90.6	13.5	5.2	0	0	297	499
Pima	5.6	5.6	88.0	89.7	6.4	4.7	1	0	6,735	8,932
Yuma	7.2	5.9	87.9	89.8	4.9	4.4	0	0	1,924	1,792
Imperial	5.6	5.9	85.1	88.1	9.3	6.0	105	52	1,662	2,260
San Diego	5.2	3.9	89.1	91.3	5.7	4.8	1	5	24,568	30,931

Sources: NCHS, Vital Statistics of the United States, vol. I, Natality, 1970 and 1980.
Vital statistics tapes from the Arizona, California, New Mexico, and Texas state health departments.

Percents are calculated for births where mothers' ages are known.
Figure for total births includes ages unknown.

TABLE 3.7

PERCENTAGE OF MOTHERS IN SELECTED PARITY GROUPS, U.S. BORDER COUNTIES, 1970 AND 1980

	Prior Births										Total Births	
	Unknown		0		1-3		4-7		8+			
County	1970	1980	1970	1980	1970	1980	1970	1980	1970	1980	1970	1980
Cameron	30.7	32.1	20.7	26.0	30.8	33.3	13.0	7.3	4.5	1.2	4115	5489
Hidalgo	28.1	31.2	19.2	25.2	32.4	33.2	14.5	8.5	5.5	1.9	5669	7614
Webb	30.5	33.3	20.3	27.5	32.8	31.4	12.7	6.6	3.6	1.3	2281	2643
Maverick	30.3	32.5	19.7	25.2	33.0	34.5	13.3	6.8	3.3	1.1	452	844
Val Verde	39.4	37.5	23.7	31.1	27.5	26.5	8.0	4.1	1.4	0.6	875	871
El Paso	37.9	38.6	23.1	29.0	29.0	22.5	8.1	3.5	1.8	0.4	9275	9915
Cochise	0.3	0	40.4	32.7	43.1	58.2	13.7	8.0	2.4	0.8	1351	1570
Santa Cruz	0	0	29.0	35.5	48.2	56.7	17.2	7.6	4.0	0.2	297	499
Pima	<0.1	0	38.9	35.7	47.3	56.7	11.8	7.1	1.7	0.5	6735	8932
Yuma	0	<0.1	35.6	31.1	48.3	58.8	13.6	9.1	1.7	0.8	1924	1792
Imperial	0	2.9	32.5	38.6	47.6	50.7	16.0	6.7	3.4	1.0	1662	2260
San Diego	<0.1	<0.7	44.2	44.5	51.1	50.6	4.1	3.8	0.5	[illegible]	24568	30931
United States	--	--	38.8	43.2	51.2	52.6	10.0	4.3	--	[illegible]	--	--

Sources: NCHS, Vital Statistics of the United States, vol. I, Natality, 1970 and 1980.
Birth tapes of respective state health departments.

TABLE 3.8

PARITY OF LIVE BIRTHS OCCURRING IN 15 BORDER COUNTIES OF TEXAS BY MOTHERS' RESIDENCE AND ETHNICITY, 1980

Residence	Texas Resident		Mexico Resident		U.S. Total
Ethnicity	Anglo	Spanish Surname	Anglo	Spanish Surname	
Numer of Births	5,669	22,976	277	3,939	--
Previous Births					
0	41.1%	32.5%	40.8%	34.9%	43.2%
1-3	53.4%	53.6%	52.4%	52.7%	52.6%
4-7	4.7%	12.0%	6.1%	10.1%	4.3%
8+	0.6%	1.9%	0.4%	2.4%	4.3%

Source: Eve Powell-Griner, Characteristics of Births in Two Areas of Texas: 1980, Working Paper No. 21 (Austin: Lyndon B. Johnson School of Public Affairs, 1983).
NCHS, Vital Statistics of the United States, 1980, vol. I, Natality, 1980.

TABLE 3.9

SIMPLE LINEAR TREND ANALYSIS -- PERCENT OF RESIDENT NEWBORNS THAT WERE UNDERWEIGHT IN U.S. BORDER COUNTIES, YEARS 1970, 1975-1980

County	Initial Percent/(#) 1970	Final Percent/(#) 1980	Sign of Trend*	Statistically Significant at 90% Confidence?*
Cameron	6.1 (253)	4.8 (266)	Negative	Yes
Hidalgo	5.8 (329)	5.5 (415)	Negative	No
Webb	7.2 (164)	5.9 (156)	Negative	No
Maverick	6.0 (27)	4.6 (39)	Negative	Yes
Val Verde	8.6 (75)	5.3 (46)	Negative	Yes
El Paso	6.9 (640)	6.3 (622)	Negative	No
Cochise	8.4 (113)	7.3 (114)	Negative	No
Santa Cruz	6.4 (19)	6.6 (33)	Negative	No
Pima	4.8 (324)	0.8 (74)	Negative	No
Yuma	5.2 (73)	6.0 (108)	Positive	No
Imperial	4.7 (78)	6.2 (140)	Positive	No
San Diego	6.4 (1,511)	6.4 (1,983)	Positive	No
U.S. - White	6.8	5.7		
Black	13.9	12.5		
Total	7.9	6.8		

Sources: Vital statistics tapes from the respective state health departments. NCHS, Vital Statistics of the United States, vol. 1, Natality, 1970 and 1980.

* Test of data for 1970 and 1975 through 1980.

TABLE 3.10

LOW BIRTH WEIGHT AS A PERCENT OF NEWBORNS BY MOTHERS' RESIDENCE AND ETHNICITY FOR BIRTHS OCCURRING IN 15 TEXAS BORDER COUNTIES, 1980

	Residence	
Ethnicity	Texas	Mexico
Anglo	5.7%	2.9%*
Spanish surname	5.4%	3.2%

Source: Eve Powell-Griner, Characteristics of Births in Two Areas of Texas: 1980, Working Paper No. 21 (Austin: Lyndon B. Johnson School of Public Affairs, 1983).

* This figure is based on only 277 births in this category.

TABLE 3.11

PERCENTAGE OF BIRTHS WITHOUT PRENATAL CARE AND PERCENTAGE DISTRIBUTION OF CARE OVER TRIMESTERS: 1970 AND 1980

					Percent of Individuals Receiving Care							
County	Percent of Total Unknown		Percent of Total w/o Care		Starting in 1st Trimester		Starting in 2nd Trimester		Starting in 3rd Trimester		Total Births	
	1970	1980	1970	1980	1970	1980	1970	1980	1970	1980	1970	1980
Cameron	1.0	5.2	13.4	2.9	59.8	57.8	27.7	28.8	12.4	13.4	4,115	5,489
Hidalgo	2.4	2.4	7.6	2.5	39.3	58.8	34.9	28.9	25.8	12.3	5,669	7,614
Webb	54.6	61.1	2.8	0.8	45.5	65.6	37.8	24.0	16.7	10.4	2,281	2,643
Maverick	10.0	5.0	2.4	0.8	58.3	69.2	27.5	24.4	14.1	6.4	452	844
Val Verde	0.6	1.3	4.0	1.4	69.2	63.0	20.2	24.2	10.5	13.1	875	871
El Paso	0.6	4.3	4.5	1.8	45.0	56.2	47.3	31.2	7.7	12.5	9,275	9,915
Cochise	--	0.5	--	1.2	--	63.7	--	28.0	--	6.7	1,351	1,570
Santa Cruz	--	0.0	--	2.4	--	49.1	--	34.5	--	16.4	297	499
Pima	--	0.1	--	2.8	--	65.6	--	27.4	--	6.6	6,735	8,932
Yuma	--	2.1	--	2.6	--	53.8	--	32.2	--	14.0	1,924	1,792
Imperial	0	0	3.4	1.5	49.8	64.5	31.5	26.2	18.8	9.3	1,662	2,260
San Diego	0	0	0.6	0.7	74.6	79.4	21.7	17.5	3.8	3.1	24,568	30,931
United States	5.2	2.8	1.7	1.3	69.1	77.3	24.6	18.8	6.3	3.9	--	--

Sources: NCHS, Vital Statistics of the United States, vol. 1, Natality, 1970 and 1980.
Birth tapes of respective state health departments.

TABLE 3.12

SIMPLE LINEAR TREND ANALYSIS -- PERCENTAGE OF BIRTHS WITHOUT PRENATAL CARE: YEARS 1970, 1975-1980

County	Initial Percent/(#) 1970	Final Percent/(#): 1980	Sign of Trend*	Statistically Significant at 90% Confidence?*
Cameron	13.4(553)	2.9(161)	Negative	YES
Hidalgo	7.6(430)	2.5(188)	Negative	YES
Webb	2.8(64)	0.8(20)	Negative	YES
Maverick	2.4(11)	0.8(7)	Negative	NO
Val Verde	4.0(35)	1.4(12)	Negative	YES
El Paso	4.5(415)	1.8(177)	Negative	YES
Imperial	3.4(55)	1.5(34)	Negative	YES
San Diego	0.6(150)	0.7(229)	Positive	NO

Source: Vital statistics tapes from the respective state health departments.

* Test of data for 1970 and 1975 through 1980.

TABLE 3.13

SIMPLE LINEAR TREND ANALYSIS -- AVERAGE TIMING OF PRENATAL CARE: YEARS 1970, 1975-1980

County	Average Week of 1st Visit 1970	Average Week of 1st Visit 1980	Sign of Trend*	Statistically Significant at 90% Confidence?*
Cameron	18.3	18.7	Positive	NO
Hidalgo	22.4	18.4	Negative	YES
Webb	20.5	17.4	Negative	NO
Maverick	18.7	16.5	Negative	YES
Val Verde	17.0	18.1	Positive	YES
El Paso	19.5	18.8	Negative	NO
Cochise	--	16.8	--	--
Santa Cruz	--	20.1	--	--
Pima	--	16.8	--	--
Yuma	--	19.2	--	--
Imperial	20.3	17.4	Negative	YES
San Diego	15.5	14.8	Negative	NO

Source: Vital statistics tapes from the respective state health departments.

* Test of data for 1970 and 1975 through 1980.

TABLE 3.14

PROPORTION OF "PRENATAL CARE UNKNOWN" RESPONSES FOR YEARS 1970, 1975-1980

County of Residence	Percent Unknown Responses: 1970	Percent Unknown Responses: 1980	Sign of Trend*	Statistically Significant at 90% Confidence?*
Cameron	1.0	5.2	Positive	NO
Hidalgo	2.4	2.4	Negative	NO
Webb	54.6	61.1	Positive	NO
Maverick	10.0	5.0	Negative	NO
Val Verde	0.6	1.3	Positive	NO
El Paso	0.6	4.3	Positive	NO

Source: Vital statistics tapes from the respective state health departments.

* Test of data for 1970 and 1975 through 1980.

TABLE 3.15

BIRTH ATTENDANT AND LOCATION FOR BIRTHS OCCURRING IN 15 TEXAS BORDER COUNTIES, 1980

15 Border Counties

Residence	Texas		Mexico		Balance of Texas	United States
Ethnicity	Anglo	Sp.-S.	Anglo	Sp.-S.		
Total Births	5669	22,976	277	3,939	245,617	--
Birth Attendant						
Physician - %	94.7	83.7	56.7	46.6	98.2	97.2
Midwife* - %	4.9	15.8	42.2	52.6	1.8	1.7
Other - %	0.4	0.5	1.1	0.8	1.8	1.1
Birth Location						
Hospital - %	92.1	74.9	48.7	36.1	98.5	99.0
Maternity Home - %	4.6	14.2	11.9	16.1	1.5	--
Home - %	1.0	1.6	0	0	1.5	1.0
Other - %	2.3	9.3	39.4	47.8	1.5	--

Sources: Eve Powell-Griner, Characteristics of Births in Two Areas of Texas: 1980. Working Paper No. 21, (Austin: Lyndon B. Johnson School of Public Affairs, 1983).
NCHS, Vital Statistics of the United States, 1980, vol. I, Natality, 1980.

* Includes certified and lay midwives.

TABLE 3.16

LAY MIDWIFE DELIVERED BIRTHS BY PLACE OF OCCURRENCE, BROWNSVILLE AND RURAL CAMERON COUNTY, TEXAS: 1974-1980

	Brownsville			Rural County*			Two Areas Combined		
		Midwife Deliveries+ Total			Midwife Deliveries+ Total				
Year	Births	#	%	Births	#	%	Births	Lay Midwife Deliveries*	Physician/ Certified Midwife
1974	4,921	3,309	67	76	74	97	4,997	3,386	1,611
1975	4,145	3,162	76	702	34	5	4,847	3,196	1,651
1976	3,716	2,965	80	994	30	3	4,710	2,995	1,715
1977	2,665	1,893	71	920	47	5	3,585	1,940	1,645
1978	1,592	693	44	1,469	627	43	3,061	1,320	1,741
1979	1,696	745	44	1,970	982	50	3,666	1,727	1,939
1980	1,681	824	49	2,101	1,011	48	3,782	1,835	1,947

Source: Rachel E.Spector, The Utilization of Parteras as a Source of Maternal-Child Health Care Along the U.S./Mexico Border, Working Paper No. 23 (Austin: Lyndon B. Johnson School of Public Affairs, 1983).

Notes: *Births occurring in the cities of Harlingen, San Benito, Port Isabel and La Feria are excluded from this table.

+Midwife category includes "other".

TABLE 3.17

TEEN BIRTHS ATTENDED BY PHYSICIANS AND LAY MIDWIVES AS A PERCENT OF PRACTICE, BROWNSVILLE AND RURAL CAMERON COUNTY COMBINED, 1974-1980

	Physicians/ Certified Midwives			Lay Midwife-Other		
Year	Total Births	Aged < 20	Percent Aged <20	Total Births	Aged < 20	Percent Aged < 20
1974	1,611	248	15.4	3,386	483	14.3
1975	1,651	264	16.0	3,196	488	15.3
1976	1,715	268	15.6	2,995	444	14.8
1977	1,645	204	12.4	1,940	317	16.3
1978	1,741	199	11.4	1,320	196	14.8
1979	1,939	238	12.3	1,727	239	13.8
1980	1,947	240	12.3	1,835	257	14.0

Source: Rachel E. Spector, The Utilization of Parteras as a Source of Maternal-Child Health Care Along the U.S./Mexico Border, Working Paper No. 23 (Austin: Lyndon B. Johnson School of Public Affairs, 1983).

TABLE 3.18

COMPARISON OF LAY MIDWIFE DELIVERIES BY PLACE OF OCCURRENCE AND PLACE OF RESIDENCE, FOUR TEXAS COUNTIES, 1980

Four Texas Border Counties

County	Place of Occurrence		Place of Residence	
	Midwife Births	Percent of All Births	Midwife Births	Percent of All Births
Cameron	2,114	31	1,016	19
Hidalgo	1,064	12	776	10
Webb	658	18	195	7
El Paso	1,202	10	756	8
Total	5,038		2,743	

Source: Rachel E. Spector, Utilization of Parteras as a Source of Maternal-Child Health Care Along the U.S./Mexico Border, Working Paper No. 23 (Austin: Lyndon B. Johnson School of Public Affairs, 1983).

TABLE 3.19

CHARACTERISTICS OF BIRTHS IN 15 BORDER COUNTIES BY MOTHER'S RESIDENCE, PLACE OF BIRTH, AND ETHNICITY, TEXAS, 1980

State of Residence	Texas				Mexico			
Mother's Birthplace	United States		Foreign		United States		Foreign	
Ethnicity	Anglo	Sp-S	Anglo	Sp-S	Anglo	Sp-S	Anglo	Sp-S
Category								
Number of Births	4,532	12,667	1,133	10,293	15	191	261	3,746
Place of Birth:								
Home	0.7	0.6	2.1	2.9	0.0	0.0	0.0	0.0
Hospital	95.2	85.5	79.6	61.8	86.7	68.1	46.4	34.3
Other/ Maternity Home	4.1	13.9	18.3	35.3	13.3	31.9	53.6	65.6
Number of Previous Pregnancies								
0	42.3	35.9	35.8	28.2	33.3	46.1	41.0	34.3
1	31.5	27.5	28.7	24.2	20.0	24.6	26.8	26.3
2	16.5	17.3	17.5	18.2	20.0	14.1	17.2	17.2
3	5.3	8.7	7.7	11.2	13.3	9.4	8.4	9.6
4	2.3	4.6	4.9	6.4	0.0	3.7	1.5	4.9
5	0.9	2.5	1.9	4.4	6.7	1.0	1.5	2.9
6+	1.2	3.5	3.5	7.4	6.7	1.1	3.6	4.8
Number of Previous Infant/Child Deaths								
0	97.5	96.3	95.5	93.1	100.0	96.9	96.6	93.5
1	2.2	3.1	3.6	5.5	0.0	2.6	2.3	5.0
2+	0.3	0.6	0.9	1.4	0.0	0.5	1.1	1.5
Number of Previous Fetal Deaths								
0	96.6	95.0	96.2	93.2	100.0	95.3	95.0	93.6
1	2.8	4.2	3.1	5.2	0.0	4.7	3.8	4.8
2	0.6	0.8	0.7	1.6	0.0	0.0	1.2	1.6

TABLE 3.19 (Cont.)

State of Residence	Texas				Mexico			
Mother's Birthplace	United States		Foreign		United States		Foreign	
Ethnicity	Anglo	Sp-S	Anglo	Sp-S	Anglo	Sp-S	Anglo	Sp-S
Category								
Attendant: M.D.	96.8	91.1	86.3	74.6	96.3	75.4	54.4	45.1
Midwife	2.8	8.6	12.9	24.8	6.4	24.6	44.5	54.1
Other	0.6	0.3	0.8	0.6	0.0	0.0	1.1	0.8
In-wedlock	93.3	89.4	91.4	91.4	93.3	92.1	94.3	92.8
Out-of-wedlock	6.7	10.6	8.6	8.6	6.7	7.9	5.7	7.2
Birthweight:								
<5 1/2 lbs.	5.7	5.8	5.7	4.9	0.0	3.7	3.1	3.2
5 1/2 lbs.+	94.3	94.2	94.3	95.1	100.0	96.3	96.9	96.8
Prenatal Care:								
1st Trimester	70.0	53.4	53.0	41.3	26.7	40.8	41.4	37.6
2nd Trimester	18.0	25.0	24.3	30.2	40.0	26.7	29.9	28.9
3rd Trimester	6.0	9.2	12.9	15.1	13.3	18.3	13.4	16.0
None	0.9	1.5	1.7	3.3	0.0	0.0	1.9	2.9
No Information	5.1	10.9	8.1	10.1	20.0	14.1	13.4	4.7
Mother's Age:								
<20	12.2	19.1	10.3	12.5	20.0	19.9	13.0	11.0
20-24	34.2	33.0	31.4	31.7	26.7	35.1	29.1	32.4
25-29	32.0	27.1	29.2	27.7	26.7	31.9	31.4	30.7
30-34	16.8	15.0	19.3	17.5	13.3	11.5	19.5	17.5
35-39	4.1	4.8	7.1	8.0	6.7	1.6	5.7	6.4
40+	0.7	1.0	2.7	2.6	0.0	0.0	1.1	2.0

Sources: Eve Powell-Griner, Characteristics of Births in Two Areas of Texas: 1980, Working Paper No. 21, (Austin: Lyndon B. Johnson School of Public Affairs, 1983).

Texas Department of Health, unpublished data.

FIGURE 3.1

BOXPLOTS: DISTRIBUTION OF CRUDE BIRTH RATES FOR THE 12 PRINCIPAL BORDER COUNTIES OVER TIME -BIRTHS BY RESIDENCE-

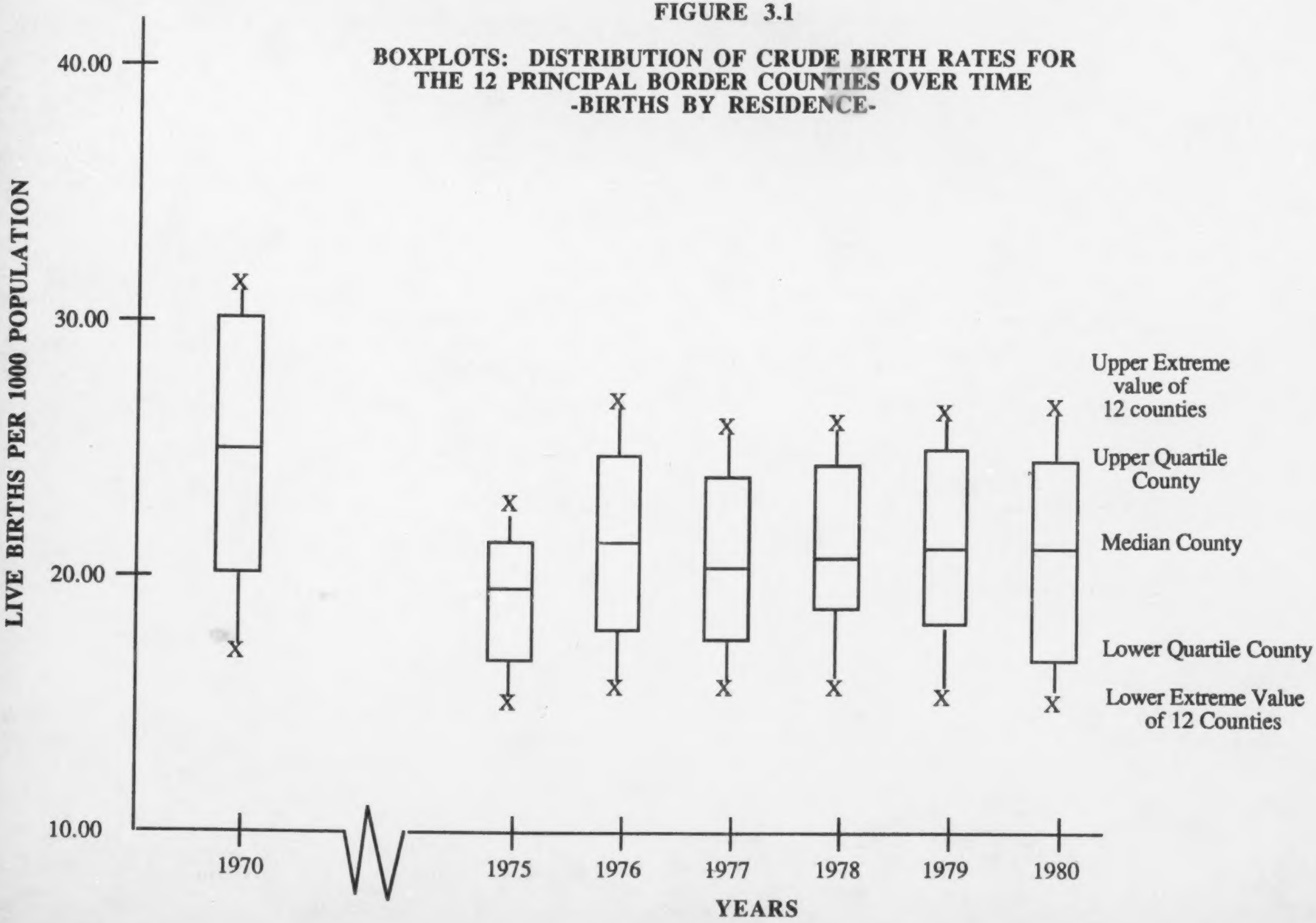


FIGURE 3.2

BOXPLOTS: DISTRIBUTION OF LOW WEIGHT BIRTHS AS A PERCENTAGE OF TOTAL BIRTHS FOR THE 12 U.S. BORDER COUNTIES: 1970, 1976-1980

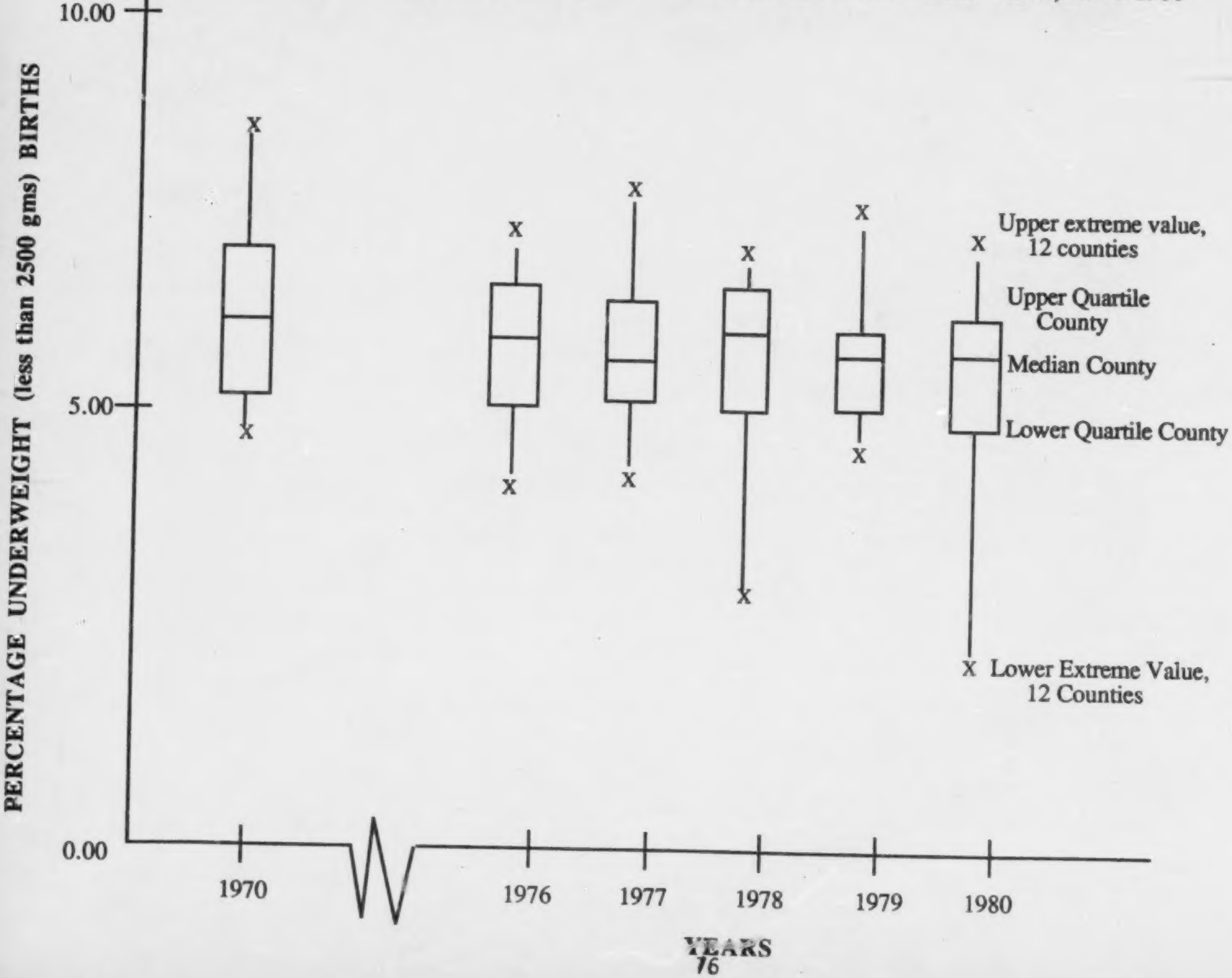


FIGURE 3.3

BOXPLOTS: DISTRIBUTION OF PERCENTAGE OF BIRTHS WITHOUT PRENATAL CARE IN THE 12 PRINCIPAL BORDER COUNTIES

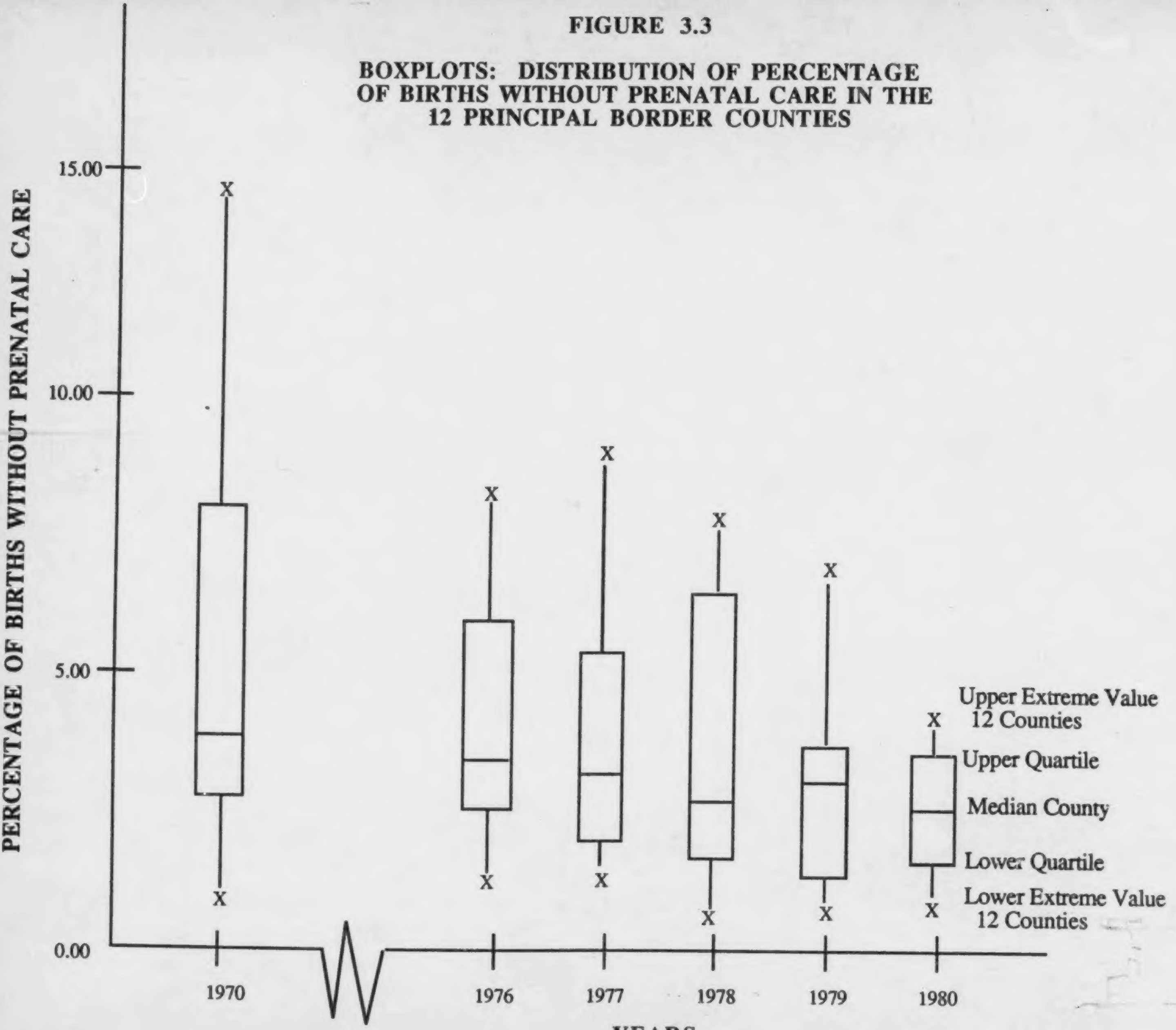
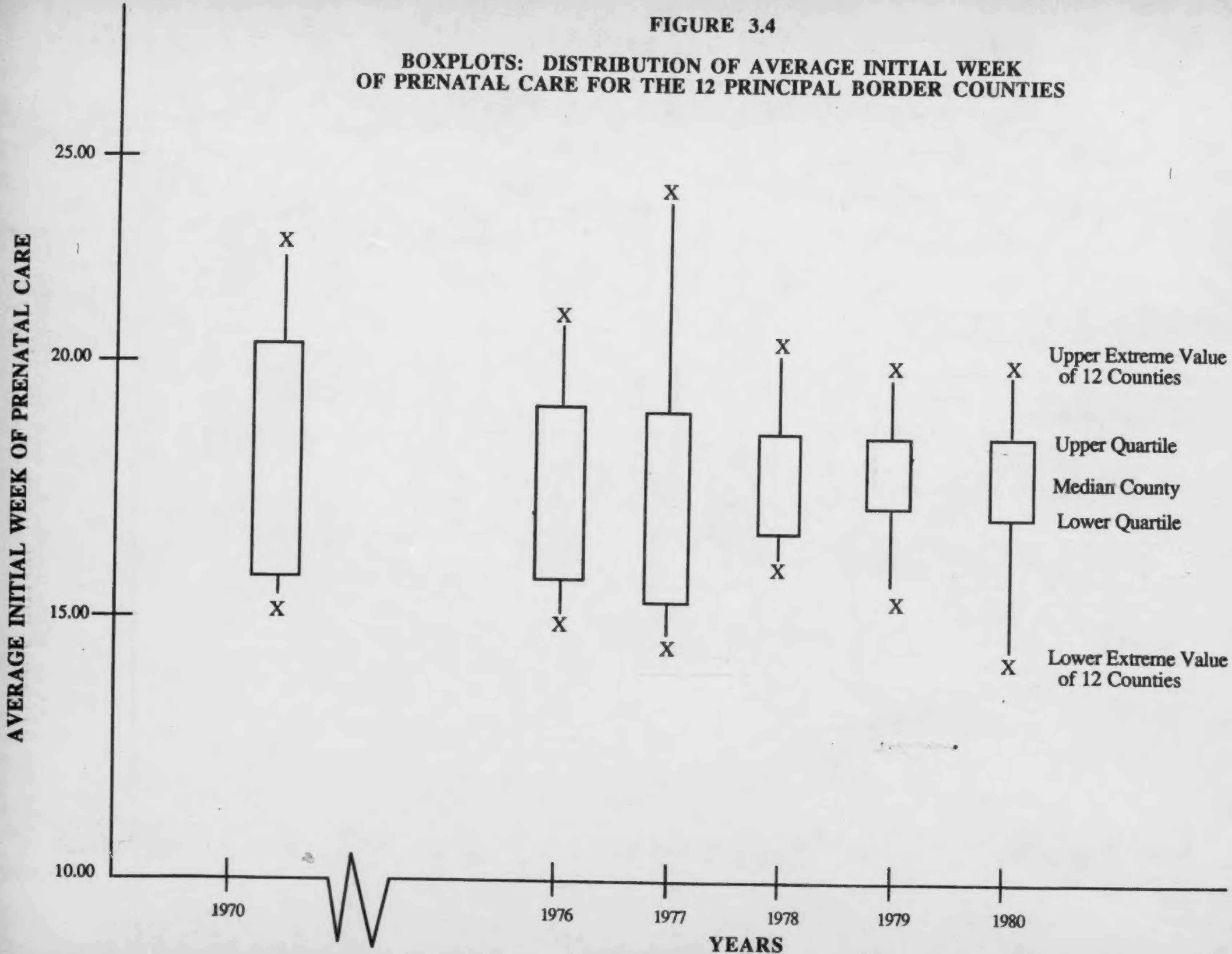


FIGURE 3.4

BOXPLOTS: DISTRIBUTION OF AVERAGE INITIAL WEEK
OF PRENATAL CARE FOR THE 12 PRINCIPAL BORDER COUNTIES



CHAPTER 4

MATERNAL AND CHILD MORTALITY STATUS

This chapter examines mortality status along the border from 1970 through 1980. All presentations are specific for the six study regions as defined earlier in this report. The chapter is divided into three sections: (1) a comparison of trends in mortality among the six regions on the U.S. side of the border, (2) a comparison of selected mortality indicators for selected years between U.S. and Mexico in the border regions, and (3) a comparison of infant mortality in Laredo and Nuevo Laredo from 1980-1982. This chapter presents an in-depth analysis of the mortality status of the six regions on the U.S. side using a systematic and comprehensive approach. The purpose of the analysis is to identify problem areas in maternal and child health in the border regions in terms of the present mortality status and the ten-year changes in mortality status from 1970 to 1980. In addition, the approach formulates a methodology and establishes baselines upon which future health care programs can be evaluated.

A comparison of mortality indicators between the border regions in the two countries is based on data commonly available from the two countries. Because only scattered mortality data were available from Mexico, the comparative analyses are limited both in scope and in value. Also, due to differences in practices of recording and reporting vital statistics between the two countries, findings based on the analysis should be interpreted with great caution. Yet the exercise has some value in that baseline data are established that may contribute to international cooperative efforts in the future.

Analyses of mortality patterns on the U.S. side of the border were based on data abstracted from computer tapes of death certificates that were provided by the respective border states for the years 1970 and 1976 through 1980. The causes-of-death categories were chosen to reflect maternal and child health considerations. The list of causes of death together with the definitions in terms of the International Classification of Diseases are provided.

The reader should be mindful of some concerns in the interpretation of the data presented here. For example, calculated mortality rates are not particularly stable over time in regions with relatively small populations. The rates can swing widely from year to year. This problem is compounded in examining particular age groups or causes of death which are small in absolute number. The reader should avoid the conclusion that a community's health has deteriorated if the evidence of increasing mortality is based on only a handful of cases. Also, where discussion covers the six border regions as a whole, the reader should bear in mind that San Diego and Pima counties contain more than 60% of the population residing in the 12 principal border counties. Thus, aggregate figures for the border are largely determined by these two counties, which, as demonstrated in prior chapters, exhibit demographic, social, and health characteristics that distinctly differ from those of the remaining counties.

4.1 Methodology

This part of the analysis specifically addresses the general mortality status of the U.S. side of the border for the following age groups: neonates (under 28 days), post-neonates (28 days to under 1 ye.ar), ages 1-4 years, ages 5-14 years, and ages 15-24 years. Maternal mortality is also examined. Due to the significant number of deaths from external causes among children, mortality due to external causes was differentiated from mortality due to diseases, which are termed "internal" causes in this report. We have used 11 age-specific general mortality indicators in this analysis:

1. Neonatal (0-27 days) mortality rate per 1,000 live births.
2. Post-neonatal (28 days-1 year) mortality rate per 1,000 live births.
3. Maternal mortality rate per 100,000 live births.
4. Mortality rate due to external causes per 100,000 persons under age 1 year.
5. Mortality rate due to internal causes per 100,000 persons under age 1 year.
6. Mortality rate due to external causes per 100,000 persons ages 1-4.
7. Mortality rate due to internal causes per 100,000 persons ages 1-4.
8. Mortality rate due to external causes per 100,000 persons ages 5-14.
9. Mortality rate due to internal causes per 100,000 persons ages 5-14.
10. Mortality rate due to external causes per 100,000 persons ages 15-24.
11. Mortality rate due to internal causes per 100,000 persons ages 15-24.

The neonatal mortality rate in the border regions is thought to be deflated by an overcount of births to residents of the border area, especially in the Texas regions. Its inclusion here is therefore for internal regional comparison, rather than for comparison between regions or with the United States. Post-neonatal mortality and maternal mortality rates presented here might also be underestimated. In the border region the number of live births leads to an overestimate of the actual infant population because a number of Mexican women cross the border to have their babies delivered in the U.S. Some of these may be counted as U.S. resident births even though both mother and infant return to Mexico after delivery. Table 4.1 illustrates this phenomenon through a comparison of the number of resident births and the census population under one year of age for 1970 and 1980. The overestimation of the under one year of age population by using live births was found to be substantial in the Texas regions and in the Imperial/Yuma region.

Age-specific mortality rates due to external and internal causes are expressed as per 100,000 population. The separation of these age-specific mortality rates into the two different categories allowed us to assess the impact of time and changes in the environment or medical care without the influence of deaths due to external causes such as automobile accidents.

The mortality indicators for each region for 1970 and 1980 were compared with the U.S. figure using rate ratios. The improvement in each region over a 10-year period was compared with the U.S. average by studying the ratio of the percentage improvement in each region to the percentage improvement in the United States.

The regions were also compared using a ranking technique. For each of the 11 indicators, the regions were ranked from 1 to 6, with 1 representing the worst or highest mortality rate. Ranking were made for 1970 and 1980.

The regions also were ranked from 1 to 6 as to the amount of improvement from 1970 to 1980, with 1 characterizing the region with the least improvement.

4.2 General Mortality Status

Mortality rates for the 11 indicators for calendar years 1970 and 1976 through 1980 by regions are included in appendix D. Tables 4.2 through 4.8 summarize the findings of the analysis of the 11 mortality indicators for U.S. portions of regions 1 through 6 and for the U.S. side of the border as a whole, respectively. The findings on each region and the border as a whole are described in the following subsections.

4.2.1 Region 1: Lower Rio Grande Valley (Cameron and Hidalgo Counties)

The Lower Rio Grande region had the worst overall mortality status of all the regions in 1970 (table 4.2). This was especially noted in deaths due to internal causes. In 1970 Region 1 had higher rates for 6 of the 11 indicators. Significant improvements over the ten-year period were observed in all areas, except in mortality due to external causes for those under one year of age. As a result, the gap in mortality status between this region and the other five regions has narrowed tremendously.

In 1980, the only mortality indicators higher than the national average were external mortality for the under 1 year (ratio of 1:39), internal mortality for the 1-4 age group (1.47), and internal mortality for the 5-14 year olds (1:01).

4.2.2 Region 2: Mid Rio Grande (Webb, Maverick, Val Verde Counties)

The variation among the different indicators appeared to be great in the Mid Rio Grande region (table 4.3). External mortality rates were low. Problem areas in 1980 were mainly related to internal mortality.

In 1980, the region ranked the highest in maternal mortality and in internal mortality for the 1-4 and 15-24 year olds. These latter two indicators actually deteriorated from 1970 to 1980, signaling the need for an in-depth search into the causes.

The external mortality rate for 15-24 year olds also deteriorated, although rates for both 1970 and 1980 were better than the national average. Maternal mortality rates in both 1970 and 1980 were above the national average. Since maternal mortality rates in this region only declined from 27.7 to 22.9 deaths per 100,000 while the U.S. rate declined from 21.5 to 9.2 deaths per 100,000 live births, the relative comparison worsened.

4.2.3 Region 3: El Paso (El Paso County)

The El Paso region made steady improvement in all mortality indicators (table 4.4). The only mortality indicator that increased from 1970 to 1980 was external mortality for the 1-4 year olds. The post-neonatal mortality rate made the least improvement among the regions. However, the post-neonatal mortality status for both 1970 and 1980 was below the national average.

In 1980, maternal mortality was the only indicator that was higher than the national average. The external mortality rate for the 1-4 year olds, although better than the national average in both 1970 and 1980, actually deteriorated in 1980.

4.2.4 Region 4: Nogales (Cochise, Santa Cruz, Pima Counties)

The Nogales region had significant improvement in general mortality status from 1970 to 1980. It should be noted that Pima County, which includes the city of Tucson, is in the region. Because Tucson is relatively large and affluent, its effect on this region's mortality status should be carefully examined.

The greatest improvement was found in the internal causes of mortality among the 5-14 year olds. In 1980, external mortality for the 1-4 and 5-14 year olds were above the national averages. The region's external mortality for the 5-14 year olds in 1980 was the only one in this category among the six regions that was higher than the national average. External mortality for the 1-4 year olds in 1980 was 85% higher than the U.S. rate, suggesting that accident prevention might be an important priority here.

4.2.5 Region 5: Imperial (Yuma, Imperial Counties)

The Imperial region had the most variation in the ranking of indicators among the six regions in 1970 and in 1980 (table 4.6). The most significant problem in this region, both in 1970 and 1980, was external mortality. External mortality ranked highest for all age groups in 1970 and for three of the four age groups in 1980. Accident prevention programs definitely should be developed in this region as well.

The 15-24 year olds had mortality rates higher than the national average for both the external and internal causes in 1980. The internal mortality rate actually worsened in 1980.

4.2.6 Region 6: San Diego (San Diego County)

In 1970, the region ranked the best or next to the best in 8 of the 11 indicators and third best in the other three (table 4.7). It made the least improvement over the decade and fell in relative rankings in 9 of the 11 categories in 1980 in comparison to 1970.

Ranking of internal mortality for under 1 changed from the best to worst, and the ranking of internal mortality for 5-14 changed from the second best to the worst among the six regions. Post-neonatal and maternal mortality also showed relatively poor improvement over the ten year period.

External mortality for the 15-24 year olds, although better than the United States averages in 1970 and 1980, worsened by 14% in 1980. The lack of improvement in some indicators and the slow improvement in others suggests the need for more in-depth investigation of this region.

4.2.7 Border as a Whole

The improvement of the general mortality status in maternal and child health along the border from 1970 to 1980 was equal to or better than that of the nation (table 4.8). However, maternal health remained a problem along the Texas border.

The external mortality rate for the 1-4 year olds remained higher than the U.S. average, indicating that accident prevention programs may be most helpful. External mortality has been a significant problem in Imperial County.

The slow improvement in general mortality status in the San Diego region requires further investigation. However, this slow improvement may simply reflect an already positive status.

4.2.8 Summary

Table 4.9 summarizes the areas of concern in maternal and child health by region based on analysis of the 11 general mortality indicators. This part of the study confirms the general impression that in 1970 maternal and child health along the border, as reflected by general mortality rates, was relatively poor, the western end of the border faring better than the east. However, over the ten-year period, the gap in health status between the west and the east narrowed tremendously, as reflected in decreasing mortality rates, especially in the east. Remaining as significant health problems for the border as a whole are maternal mortality and mortality due to external causes for the 1-4 age group. Maternal mortality along the Texas border remained a health problem. This may be related to the significantly higher proportion of deliveries in settings outside of the hospital. Further, due to the possibility of over-counting of resident births, the maternal mortality rates presented here might be under-estimating the true picture.

External causes of death among 1-4 year olds were higher than the national average in most regions. Further examination of the types of external causes is called for to identify prevention strategies for the regions. Of greatest concern are deaths due to external causes in the Imperial Region, which has had extremely high rates since 1970.

Finally, rates based on the number of live births as the denominator are not reliable estimates of the true mortality status because of the large discrepancy between the number of live births and the infant population enumerated in the census. Infant mortality rates probably are deflated because an overestimate of the infant population results when the reported number of resident live births is used as a denominator. Improvements in data reporting, collection, and analysis are necessary to enhance the reliability of the indicators.

4.3 Cause-Specific Mortality Rates

4.3.1 Methodology

The researchers sought to compare the principal border counties with the United States as a whole for causes of death specifically related to maternal and child health. Although many causes of death were identified as good indicators of maternal and child health status, many of them are relatively uncommon, and are unreliable because their numbers fluctuate excessively. Additional restrictions were encountered when we tried to find a common set of causes of death that allowed a comparison of the border region with the national averages. As a result, 22 causes of death were selected that satisfied these two criteria: (1) they reflect maternal and child health status, and (2) national averages are readily available for comparison. The list of the 22 causes of death is displayed in table 4.10.

Of the 22 causes of death, three are of broader scope than the rest: "total infective and parasitic diseases," "other diseases," and "external causes." They are included in this study because they represent important classes of causes of death relating to child health, and yet a finer breakdown is not possible. "Total infective and parasitic diseases" is a very broad category including many different types of diseases. Eight causes of death in this category are singled out in the study. The remaining causes in this category are many, and the frequency of their occurrence is small. Therefore, the aggregate of the infectious and parasitic diseases is used here to reflect improvements in health status among children in the border regions. "Other diseases" is an aggregate measure used to identify any unexpected causes of death that are not identified among the 22 causes. A significantly high rate of this class would signal possible problems in causes of death other than the ones studied here.

"External causes" has been studied as a general mortality indicator in the first part of the analysis. In this part we intended to study the different causes of external deaths. However, we encountered difficulty in finding U.S. standards comparable with the mortality information retrieved from the state data tapes. The national data system publishes external mortality rates based on the E-codes of the ICD coding system. The state mortality tapes used codes 800-999 to denote external causes. The former method aggregates causes of death by type of accident (e.g., auto, bicycle, etc.), while the latter aggregates by type of injury. Because of this difference, we were forced to study external causes as a class in this analysis.

The analysis of mortality by the 22 causes of death consists of (1) a comparison of the changes in the leading causes of death from 1970 to 1980 for each of the four age groups for the border as a whole (in this section), and (2) the identification of the problem areas in each region as well as the border as a whole in terms of the 22 causes of death (in the following section).

4.3.2 Leading Causes of Death

Tables 4.11 through 4.14 present the leading causes of death for the under 1, 1-4, 5-14, and 15-24 year olds respectively for calendar years 1970 and 1980. The information should assist in establishing priorities in terms of the absolute number of deaths by causes. It also allows a comparison of the changes in the ten-year period. The findings are summarized as follows:

Under 1 Year Olds

- Enteritis and diarrheal diseases and avitaminoses and nutritional deficiencies were among the leading causes of deaths in 1970 but had disappeared from the list in 1980.

- Pneumonia dropped from third place in 1970 to the fifth place in 1980, accompanied by a significant (89%) decrease in magnitude of the rate.
- Meningitis and septicemia remained in the same ranking positions, but the mortality rate had been reduced by about 50%. Both rates were still higher than the national average.
- Diseases of early infancy and congenital anomalies remained the most significant causes of death for those under 1 year old, although the mortality rates from these causes were much reduced.
- Accidents and external causes of death became the third leading causes of death in 1980, even though the rate decreased.
- Diseases of the circulatory system was the fourth ranking cause of death and demonstrated an increase in mortality rate in 1980. The increase was also observed in the U.S. rates. Thus, it is likely that increased reporting and better diagnosis of this class of diseases accounted for the increased rate.
- Malignant neoplasms appeared in the 1980 list of leading causes of death, while it was absent from the 1970 list. The nation had a 32% improvement in the mortality rate due to malignant neoplasms, but the border as a whole experienced a large increase in the mortality rate due to malignant neoplasms. The 1980 rate was 3.25 times higher than that of the nation.

Ages 1-4

- Measles, tuberculosis, and septicemia disappeared from the list of leading causes of death in 1980 among children in this age group. In 1970, the border had significantly higher mortality rates in these categories than did the nation.
- The order of other causes of death did not change. Accidents and external causes not only remained the leading cause of death, but also increased from 46% in 1970 to over 50% of the deaths in this age group in 1980. Mortality rates due to accidents and external causes were above the national average in both years.
- Mortality rates with increased magnitude in 1980 were diseases of the circulatory system and ill-defined conditions. The former might be related to better diagnosis, but the latter signified that there might be an underlying problem in health for this age group.

Ages 5-14

- The two diseases with the highest ratios to the U.S. averages in 1970, meningococcal infections and septicemia, do not appear on the list in 1980.
- Fewer diseases were on the list of leading causes of death in 1980.
- Accidents and external causes and malignant neoplasms were the most important leading causes of death in this age group. The latter had rates higher than the U.S. average in both 1970 and 1980.
- Although meningitis appeared in the 1980 list and had a rate double that of the U.S. average, there was only one death related to this cause.

Ages 15-24

- In 1970, accidents and external causes explained 75% of the deaths in this age group; in 1980, this percentage increased to 82%.
- Mortality due to meningococcal infections, which had four times the national rate in 1970, does not appear among leading causes of death in 1980. Septicemia appeared in the 1980 list with a rate four times that of the national average.
- Pneumonia was the third ranking cause of death in 1970 in this age group. It dropped to the seventh in 1980.
- Deaths due to other diseases in general showed improvement in 1980.

4.3.3 Summary of Leading Causes of Death

Pneumonia and many infectious diseases were significant causes of deaths in children in 1970. They shared the greatest improvement over the ten-year period. Death rates due to pneumonia were much reduced and many infective and parasitic diseases disappeared as leading causes of death.

Death rates due to diseases of the circulatory system increased in magnitude in 1980 in most age groups. This might be due, in part, to increased reporting and better diagnosis. Deaths due to malignant neoplasms among those under 1 year of age, and septicemia among the 15-24 year olds, stood out in 1980 when compared to the U.S. averages.

Death rates due to accidents and external causes of death among 1-4 year olds were higher than the national averages in both 1970 and 1980. Accidents and external causes were the leading causes of death among children past infancy.

4.4 Regional Differences in Causes of Death

This part of the study specifically addresses problem areas in terms of causes of death for each of the six border regions. The analysis of the 88 age-cause-specific mortality rates in each region (4 age groups x 22 causes of death) involved classifying them by two dimensions: (1) the 1980 mortality status, and (2) the 1970 to 1980 improvement status. To summarize the findings we simplified the classification by the following scheme:

1. 1980 Mortality Status:
    ++ Much worse than U.S.; ratio to U.S. rate equal to or greater than 1.50.
    + Worse than U.S.; ratio to U.S. rate between 1.01 and 1.49.
    0 Equal to or better than U.S.; ratio to U.S. rate equal to or less than 1.00.
2. 1970-1980 Improvement Status:
    ** Deterioration of status
    * Improvement slower than U.S.
    0 Improvement faster than U.S.

Based on this scheme, the findings are summarized in tables 4.15 through 4.21 for Regions 1 through 6 and the border as a whole, respectively. The findings are highlighted in the following subsections.

4.4.1 Region 1: Lower Rio Grande (Cameron and Hidalgo Counties)

The mortality rate due to malignant neoplasms ranked among the highest in this region. This category of mortality deteriorated from 1970 to 1980 and was much worse than the United States for three of the four age groups: under 1, 1-4, and 5-14 year olds. Deaths due to septicemia and meningitis also appeared as problem areas in this region. All four age groups suffered a deterioration in mortality status and rates were much higher than those of the United States as a whole. Accidents and external causes of death appeared to be a problem among those under 1 in this region.

Among the 1-4 year olds, in addition to problems of septicemia and malignant neoplasms, mortality rates due to other diseases and pneumonia were undesirable and improvement slower than the U.S. The mortality rates due to diseases of the circulatory system and ill-defined symptoms, though still higher than the U.S. in 1980, improved faster than the United States.

The 5-14 year olds had a significantly higher mortality status for malignant neoplasms and meningitis, and improvement was much less than the U.S. Although the rate for ill-defined conditions was significantly worse than the U.S., improvement was more rapid. Among the 15-24 year olds, mortality rates due to infective and parasitic diseases and ill-defined conditions appeared to be the leading problems. Mortality status due to diseases of circulatory system and congenital anomalies deteriorated.

In general, each age group still suffered from significant health problems in 1980 in this region. Among the most important ones are: malignant neoplasms, infectious and parasitic diseases, other diseases, and ill defined conditions.

4.4.2 Region 2: Mid-Rio Grande (Webb, Maverick, and Val Verde Counties

As discussed earlier in this chapter, maternal mortality in region 2 was much higher and showed a slower improvement than that for the United States. Pneumonia had a much worse mortality status in three of the four age groups, although improvement was faster than the United States in two of the three age groups. However, mortality due to pneumonia among the 1-4 year olds deteriorated.

Mortality due to other diseases was also a significant problem in this region. It deteriorated for all age groups and was much higher than the United States in three of the four age groups. This finding indicates that an in-depth analysis into other causes of death is in order.

The 1-4 and 15-24 year olds appeared to have very significant health problems as reflected by the chronic diseases mortality status among the 1-4 year olds and both chronic and infectious diseases mortality status among the 15-24 year olds. Both age groups experienced deterioration in the overall age-specific mortality rate.

The findings earlier in this chapter indicating significant problems in internal causes of mortality are substantiated here.

4.4.3 Region 3: El Paso (El Paso County)

No one problem is significantly worse in more than one age group. Different age groups had different health problems. The under 1 year olds appeared to have the worst mortality status. Mortality status was greater than in the United States in 1980 in the following categories: infectious and parasitic diseases including meningococcal infections and septicemia, and chronic diseases including benign neoplasms and diseases of the circulatory system. Mortality due to other diseases also deteriorated. Therefore, although the overall mortality status of this region appeared to be good, health problems among infants might still be significant.

In general, the 1-4 year olds enjoyed a healthy status. However, mortality rates due to accidents and external causes and ill-defined conditions deteriorated in 1980. The 15-24 year olds had significant problems with septicemia and moderate problems with diseases of the circulatory system and other diseases.

4.4.4 Region 4: Nogales (Cochise, Santa Cruz and Pima Counties)

This region enjoyed the distinction of having the least number of health problems as reflected in mortality rates. This result may stem from the inclusion of Tucson (Pima County) in the study. Tucson's large size and distance from the border may obscure conditions directly on the border.

Among the four age groups, the 15-24 year olds had the most significant problems related to infectious and parasitic diseases including septicemia and pneumonia. Mortality rates from congenital anomalies and from other diseases also were much higher than those for the United States for this age group.

Septicemia and pneumonia were significant causes of death among those under 1 year; the 1980 mortality status was much worse and improvement slower than the U.S. Accidents and external causes of death appeared to be a problem among the 1-4 and 5-14 year olds in this region.

Deterioration in mortality status was observed in diseases of the circulatory system and ill-defined conditions among the 1-4 year olds and in malignant neoplasms, other diseases, and accidents and external causes among the 5-14 year olds. As a result, the overall 1980 mortality rate among the 1-4 year olds was still higher than the U.S. and improvement among 5-14 year olds in the overall mortality rates from 1970 to 1980 was slower than the United States.

4.4.5 Region 5: Imperial (Yuma and Imperial Counties)

Malignant neoplasms and other diseases were significant health problems in this region as reflected in mortality rates; three of the four age groups had a higher 1980 mortality status and a deteriorating ten year improvement rate.

Accidents and external causes of death remained significantly higher than the United States in three of the four age groups, although improvement was better than the U.S. for two of the three age groups. Post-neonatal mortality decreased significantly but remained above the U.S. average. Among the four age groups, those under 1 appeared to have the most problems as reflected in the mortality rates due to a variety of causes of death; namely, infectious and parasitic diseases, chronic diseases, other diseases, and accidents and external causes. The 1-4 year olds had significantly higher mortality rates due to other diseases, and accidents and external causes resulting in an overall mortality status higher than the U.S. average in 1980. The only significant mortality status among the 5-14 year olds was found to be malignant neoplasms.

The overall mortality rate for the 15-24 year olds in this region was much higher than the United States in 1980 and deteriorated from 1970 to 1980. This phenomenon was mainly related to significantly higher rates for accidents and external causes and other diseases, and deteriorating trends for infective and parasitic diseases, ill-defined conditions, and other diseases.

4.4.6 Region 6: San Diego (San Diego County)

A large number of rates for this region were either higher than the U.S. figures in 1980 or slower in improving over the decade. Many of the age-cause-specific rates were on the list because of their deterioration or slow progress during the ten-year period. Because San Diego is a large and diverse community, these findings most likely reflect the changing demography of the region.

The problem areas were distributed evenly among the four age groups, each with seven on the list. Post-neonatal and maternal mortality were also on the list. The under 1 year olds appeared to have problems both in the 1980 mortality status and in improvement of rates for causes due to infective and parasitic diseases, meningitis and malignant neoplasms. Among the 1-4 year olds, mortality rates due to diabetes mellitus and meningitis were problems both in terms of 1980 status and in improvement. Diseases of the circulatory system, other diseases, and ill-defined conditions deteriorated from 1970 to 1980 but the mortality status was still better than the United States. Among the 5-14 year olds, mortality due to infective and parasitic diseases, malignant neoplasms, diseases of the circulatory system, pneumonia, and congenital anomalies were worse than the United States both in status and in improvement. Mortality rates due to other diseases and external causes remained lower than U.S. averages in 1980 but the ten-year improvement was less.

Most of the problems among the 15-24 year olds were related to the change from 1970 to 1980. Mortality rates due to septicemia, benign neoplasms, diseases of the circulatory system, congenital anomalies, and external causes deteriorated in 1980 while progress in mortality due to diabetes mellitus and other diseases was slower than in the United States. As a result, the 15-24 year olds' mortality rates worsened in 1980 and the under 1 and 5-14 year olds mortality rates progressed slower than the U.S. rates. However, all age-specific mortality rates in this region were still better than the U.S. rates in 1980.

4.4.7 Border as a Whole

Region 1 and Region 2 had the most health problems as reflected in mortality status when compared to the United States in 1980. Region 6 had the biggest problem in terms of poor improvement over the ten-year period.

Mortality rates due to septicemia and malignant neoplasms were the highest on the border as a whole. The 1980 mortality status of septicemia among those under 1 and 15-24 year olds deteriorated over the ten-year period. Mortality due to malignant neoplasms was a problem among those under 1 and the 5-14 year olds. The mortality status was much worse than the U.S. and the mortality rate deteriorated in 1980 among those under 1 year of age. The infants in general were still having problems with deaths caused by infective and parasitic diseases, including meningococcal infections, septicemia, and meningitis.

The 1-4 year olds had problems related to chronic diseases and external causes. Worsening trends were observed in deaths due to diabetes mellitus, meningitis, diseases of the circulatory system, ill-defined conditions, and other diseases. Causes that were still above the U.S. averages in this age group included diabetes mellitus, pneumonia, other diseases, and accidents and external causes.

The 5-14 year olds had only two significant problems: malignant neoplasms and meningitis. Both mortality rates were higher than the 1980 United States rates and were improving slower than the U.S. Slower progress was observed among the 15-24 year olds in mortality rates due to diabetes mellitus, diseases of the circulatory system, congenital anomalies, and other diseases. As mentioned before, deaths due to septicemia, specifically, and infective and parasitic diseases in general, were the greatest health problems in this age group.

4.5 Overview of Mortality in the Principal Border Counties

Analysis presented thus far in this chapter compared the United States with each region and with the border as a whole in terms of general mortality rates and specific causes of death. The four age groups were chosen to be compatible with annually published U.S. vital statistics so that future comparisons could be made to monitor health status on the border. The methodology and the choices of parameters used here were specifically designed with this purpose in mind. Mortality statistics, though dated to a certain extent, are fairly reliable and consistent, and the researchers expect future studies to monitor health status along the border by making similar comparisons.

The causes of death selected for this analysis reflect current availability of data. The list can be expanded or altered depending on the findings as to causes of death and on future availability of usable data. The findings in this analysis for the category termed "other diseases" call for further investigation into specific causes of death which make up this category. Further, because of differences in coding and in analyses, external causes of death were studied as an aggregate in this chapter. The researchers recommend that the causes of the injuries and deaths should be studied further, especially in areas where external causes of death explained the majority of deaths in children past 1 year of age.

Fetal deaths were not examined in this analysis. The major reason for the exclusion was the unreliability of the data. The border region is unique in terms of reporting and recording of fetal deaths. Compounded with the possible overestimation of the denominator (resident live births plus fetal deaths) in the calculation of a fetal mortality ratio, the interpretation of fetal mortality trends would be most difficult. Better recording and reporting systems are needed to allow the use of the fetal mortality ratio as a reliable health status indicator on the border.

The usefulness of mortality indicators is limited to the illnesses and injuries that cause death. Many health problems are significant in terms of other outcome measures such as loss of working days, loss of productivity, chronic handicapping conditions, and deterioration in health status. Thus, this chapter, by examining only deaths, presents but a portion of the larger picture that identifies and describes the maternal and child health problems in the border region. Findings in this chapter should be used in conjunction with findings in other chapters to truly understand the health problems and assess the health status of the border region.

4.6 Comparison of Selected Mortality Indicators between Mexico and the United States

This portion of the analysis compares maternal and child mortality in Mexico's border states with those in the six United States border regions (12 counties). At the outset of the study, we hoped to collect a body of comparable data on the communities on each side of the border. In Mexico, we located useful information at the national or state level of aggregation. Mortality data for some municipios in scattered years were found. However, because of the lack of consistency and, at times, inadequate denominators, little of the data for municipios could be used. Instead the six northern border states in Mexico were considered as a proxy for the border regions. This tactic is subject to some error because the combined population of the six border regions constitutes only 25% of the total population of the border states and because economic conditions on the border are better than they are in the interior.

Comparisons across the border are made for six indicators. The maternal mortality rates per 100,000 live births for 1970 and 1974 are contrasted. Neonatal and infant mortality are examined as are mortality rates for age groups 1-4, 5-14, and 15-24. The analysis compares data for 1970 and 1976. Table 4.22 presents mortality rates for U.S. border regions, Mexican border states, and the respective nations as a whole. Within each country, the table provides ratios of border to national rates. Percentage changes over time for the respective areas are shown, as are ratios of percentage changes in border areas to percentage changes in the respective nations. Ratios of Mexico and U.S. rates for the border and for the nations are calculated, as are ratios of percentage changes in Mexico over percentage changes in the U.S. for the border areas and nations respectively.

4.6.1 Comparison of the Border Areas with the Respective Nations

Table 4.22 presents the six mortality indicators for the United States and Mexico for the border region and the nation as a whole. The ratio of the border region to the nation was also derived for each indicator.

In the United States border region, in 1970, the maternal and infant mortality rates were slightly lower than the nation's rates. The mortality rate for the 1-4 age group was higher than the national rate. The rate for the 5-14 year olds was similar to the U.S. rate, and the rate for 15-24 year olds was lower than the national rate. Over the years studied, rates on the border and nationally all declined. Except for the 15-24 age group, rates for the border declined proportionally faster than the national rates, so that in the more recent year, rates for the border were lower or equal to national rates. The neonatal mortality rate in 1976 for the border regions, however, was 1.2 times that of the U.S.

For Mexico, all mortality rates for the border states were lower than for the nation as a whole. The mortality rates for the border for the 1-4 and the 5-14 year olds were much lower than the national rates. Over the years studied, mortality rates for Mexico's border states generally declined more quickly than Mexico's national rates.

Among the three age groups above 1 year in the United States, the 15-24 year olds had the highest mortality rates. In Mexico, the 1-4 year olds had mortality rates much higher than the other two age groups. The lowest mortality rate occurred among the 5-14 year olds in both countries.

4.6.2 Comparison between the United States and Mexico

The last two columns of table 4.22 present ratios of the mortality rates for Mexico over those of the United States. The ratios are calculated to compare the border regions and to contrast the national rates. All ratios indicate that health status in the border region in Mexico was worse than in the border region in the United States. The maternal mortality rate in Mexico's border states in 1974 was almost six times the rate in the U.S. border region. The smallest differences in 1976 occurred in neonatal mortality and mortality for the 15-24 year olds. The small difference in neonatal mortality rates between the United States and Mexico border areas in 1976 should be interpreted with caution because the figures may be affected by over-counting of births and under-counting of neonatal deaths in the U.S. border region.

In general, the magnitude of the differences between Mexico and the United States was smaller when comparing the border regions than when comparing the two nations. For the nations as a whole, with the exception of maternal mortality, the percentage improvement in Mexico was equal to or better than the United States. This is most likely due to the initially high mortality rates in Mexico. For the border regions, both maternal and infant mortality improved more slowly in Mexico than in the United States. The extremely high ratio for the 15-24 year olds in the border region was primarily due to the lack of improvement in the United States border area.

4.6.3 Summary of U.S./Mexico Border Area Comparison

Mexico's border states had a better maternal and child health status as reflected in mortality rates than did Mexico as a whole. Such was not true for the United States. Maternal mortality, infant mortality, and the mortality rate for 1-4 year olds in Mexico's border states were more than three times the rates for the U.S. border counties. Among the three age groups over 1 year of age, the national mortality rate for the 1-4 year olds in Mexico was the highest, with a magnitude about 13 times that of the United States in 1970 and about 7 times in 1976. The magnitude of this ratio was about half when border areas rather than the overall nations were compared. Mexico's border states made significant improvement from 1970 to 1976 in mortality rates among children older than 1 year. However, maternal mortality improved slower than on the U.S. border from 1970 to 1974.

4.7 Infant Mortality in Laredo and Nuevo Laredo

Alfonso Ortiz, a participant in this research effort, examined infant death certificates for Laredo and Nuevo Laredo covering the three-year period 1980-82.[1] Of 77 infant deaths which occurred in Laredo, Webb County, 38% occurred during the first day of life and 25% occurred in the post-neonatal period (table 4.23). In Nuevo Laredo, of 567 infant deaths occurring in the same three years, only 4% were during the first day of life and 57% were in the post-neonatal period.

Ordinarily, one might expect about half of the infant deaths to occur in the neonatal period (under 28 days) and half in the post-neonatal period (28 days to one year). A high neonatal death rate would generally be viewed as evidence of inadequate services, especially neonatal intensive care. Excessive post-neonatal mortality, on the other hand, would be evidence of a poor post-hospital environment. However, in the case of Laredo/Nuevo Laredo, it is clear that migration across the border and from surrounding U.S. communities for birthing services is inflating the number of Laredo's infant deaths that occur in the first day of life. By the 1-6 day period, the babies are returning to Mexico or U.S. communities in the surrounding area. Closer inspection of the raw data reveals that five of the infant deaths occurring in Laredo were among Mexican residents and nine were to U.S. residents from outside of Laredo. Out of the much larger number of Nuevo Laredo infant deaths, ten were to U.S. residents and one was from elsewhere in Mexico.

Table 4.24 examines infant mortality rates by place of residence and place of occurrence for Laredo, and by place of occurrence for Nuevo Laredo for the three-year period 1980-82. Most striking is the fact that almost 1,000 more births occurred each year in Laredo than were delivered by Laredo residents. Because these babies return to Mexico and surrounding U.S. communities, we can see that the infant mortality rate by occurrence for Laredo is somewhat deflated in comparison to infant mortality by residence. Part of the deflation occurs in the neonatal period, but the largest decrease is in the post-neonatal period.

If all of the non-resident births occurring in Laredo were to women crossing the border from Mexico, then the Nuevo Laredo infant mortality rate could be recalculated at about 31 per 1,000 (this estimate ignores deaths occurring in Laredo to Nuevo Laredo resident babies). Thus, the infant mortality rate shown for Nuevo Laredo is somewhat higher than is actually the case, but the error is proportionately small and the true resident infant mortality rate for Nuevo Laredo is certainly above 30 per 1,000 live births.

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[1] Alfonso Ortiz, Comparative Study of Infant Mortality in the Texas-Mexico Border Area of Laredo/Nuevo Laredo, Working Paper No. 29 (Austin: Lyndon B. Johnson School of Public Affairs, 1984).

On the other hand, because a certain number of women from Mexico give birth in Laredo and inaccurately represent themselves as Laredo residents, the number of resident live births for Laredo is inflated and Laredo's resident infant mortality rate is consequently deflated. We have no easy method for adjusting the data for this phenomenon. However, because we know that post-neonatal mortality will be affected more than neonatal mortality, and if we assume that post-neonatal and neonatal deaths are about equal in number, than we would conclude that Laredo's resident infant mortality rate is not 9.4 per 1,000, but perhaps 12 or 13 per 1,000 live births. That figure would be viewed as somewhat high in comparison to the overall rate for the United States. Of course, the reader must view this discussion as speculative.

Cause of death information is more solid. Table 4.25 presents causes of the infant deaths occurring in Nuevo Laredo and Laredo from 1980 through 1982. The causes of death are not partitioned in a conventional manner, but were preselected to highlight conditions specific to the issue of infant mortality on the border.

In Nuevo Laredo, bronchitis and pneumonia (ICD 485-486) account for 23% of infant deaths; in Laredo, they account for only about 3%. That category, combined with respiratory distress syndrome (ICD 769) and other respiratory diseases (ICD 460-484, 487-519), accounts for 47% of Nuevo Laredo's infant deaths and 34% of Laredo's. Of particular interest is the listing of malnutrition of the third degree (ICD 262) accounting for 3% of infant deaths occurring in Nuevo Laredo. Non-infectious gastroenteritis (ICD 558) and intestinal infectious diseases (ICD 001-009) jointly resulted in 94 deaths or 17% of the infant deaths occurring in Nuevo Laredo. Bacterial meningitis (ICD 320) and meningitis of unspecified cause (ICD 322) killed five babies in Nuevo Laredo and one in Laredo.

While immaturity (ICD 765) accounted for only 4% of the Nuevo Laredo infant deaths and about 1% of Laredo's, the larger category "certain causes originating in the perinatal period" (ICD 760-779), which also includes immaturity (ICD 715) and respiratory distress syndrome (ICD 769), accounted for 33% of the Nuevo Laredo deaths and 58% of the Laredo deaths. Similarly, 17% of the Laredo deaths and only 4% of the Nuevo Laredo infant deaths were attributed to congenital anomalies.

Table 4.26 examines the same data for post-neonatal deaths only. Because the causes are listed in the same order as in the previous table, some differences between neonatal and post-neonatal causes of death are immediately apparent. In Nuevo Laredo, bronchitis and pneumonia (ICD 485-486) remains the most frequent cause of death among post-neonates. However, among this group, they account for 31% of deaths rather than 23% of all infant deaths. Respiratory distress syndrome, immaturity, and other causes originating in the perinatal period lose their importance and account for relatively few post-neonatal deaths. However, symptoms, signs and ill-defined conditions become more important, as do non-infectious gastroenteritis and intestinal infectious diseases. These last two causes account for 26% of post-neonatal deaths in Nuevo Laredo.

In Nuevo Laredo, all 17 infant deaths caused by malnutrition of the third degree were post-neonatal deaths. This cause accounted for 5% of the post-neonatal deaths. Similarly all infant deaths from meningitis of unspecified cause, fractures, tuberculosis, other infectious and parasitic diseases, and bacterial meningitis occurred in the post-neonatal period.

Elimination of all respiratory diseases (except distress syndrome), infectious and parasitic diseases, malnutrition, meningitis, and gastroenteritis among post-neonates in Nuevo Laredo would achieve a 68% reduction in post-neonatal mortality and a 39% reduction in infant mortality. Elimination of these causes of death among all infants, including neonates, would achieve a 46% decrease in infant deaths.

Because only 20 post-neonatal deaths occurred in Laredo, analysis is difficult. However, elimination of the above listed causes of death among post-neonates in Laredo would have decreased post-neonatal deaths by 30%, but infant deaths by only 8%. These causes of death were found only among post-neonatal deaths.

4.8 Conclusion

This comparison of maternal and child mortality status between the United States and Mexico is extremely limited. We were unable to compare the general mortality status for years more recent than 1976, we have little information for the border municipios, and cause of death data are very limited. However, some general impressions are documented in the analysis of the six mortality indicators. We have documented that maternal and child health was better in Mexico's border region than in other parts of Mexico. We documented that maternal mortality on Mexico's side of the border was much worse than on the United States side, and that improvement was slower. We found that 1-4 year olds in Mexico's border region had the highest mortality rates among the three age groups over 1 year.

Examination of infant deaths occurring in Laredo and Nuevo Laredo provides some evidence, although indirect in nature, that resident births on the U.S. side are over-counted resulting in an under-estimate of infant mortality, especially post-neonatal mortality. Inspection of cause of death data documents the more hazardous environment for infants on the Mexican side of the border. Perhaps two-thirds of the post-neonatal deaths and almost half of infant deaths are from preventable causes - infections and parasitic diseases, malnutrition, respiratory diseases, meningitis, and gastroenteritis.

As documented earlier in this report, the target population for maternal and child health services on the U.S.-Mexico border is large and growing rapidly. Although health conditions on the border are generally improving, rapid expansion of the target population indicates that demands on health authorities and providers will continue to grow. Even with improved health status and environmental conditions, health care providers may encounter increasing numbers of preventable deaths. Thus, continued efforts to strengthen maternal and child health programs will be required. International cooperation at local, regional, and national levels can greatly enhance this process, and policymakers on the U.S. side of the border must recognize that improvement of maternal and child health status in Mexico will in turn improve the health status of mothers and children in the United States.

TABLE 4.1

COMPARISON OF NUMBER OF RESIDENT BIRTHS AND CENSUS POPULATION UNDER 1 YEAR

	1970			1980		
Region	Births	Population Under 1	Percent Difference*	Births	Population Under 1	Percent Difference*
1 - Lower Rio Grande	9,784	7,244	-26.0	13,103	10,586	-19.2
2 - Mid Rio Grande	3,608	2,838	-21.3	4,358	3,700	-15.1
3 - El Paso	9,275	8,062	-13.1	9,915	9,583	-3.3
4 - Nogales	7,925	7,620	-3.8	11,001	10,363	-5.8
5 - Imperial	3,055	2,630	-13.9	4,039	3,630	-10.1
6 - San Diego	24,568	23,312	-5.1	30,877	29,185	-5.5
Region Total	58,215	51,706	-11.2	73,293	67,047	-8.5
U.S.A.	3,731,386	3,487,000	-6.5	3,612,258	3,433,000	-5.0

Source: Birth tapes from the respective state health departments.
U.S. Census, 1970 and 1980.

* Some of the difference may be due to infant mortality (ranging from .7 to less than 2%) and to the fact that the 1980 population under 1 is calculated on April 1, 1980 and births in 1980 are for the full year. Net immigration of children below the age of 1 in the year prior to April 1, 1980 would, however, tend to inflate the census figures.

TABLE 4.2

SUMMARY ANALYSES OF ELEVEN MORTALITY INDICATORS
U.S. REGION 1: LOWER RIO GRANDE

					External Mortality				Internal Mortality			
Comparative Indicators		Neonatal Mortality	Post-Neonatal Mortality	Maternal Mortality	Under 1	1-4	5-14	15-24	Under 1	1-4	5-14	15-24
Comparison with U.S.												
Status (Ratio to U.S.)	1970	0.89	1.33	1.42	0.75	1.23	0.97	0.93	1.28	1.86	1.89	0.98
	1980	0.68	0.83	0.83	1.39	1.00	0.89	0.92	0.87	1.47	1.01	0.95
Improvement (Ratio to U.S.)	70-80	1.30	3.00	1.32	-0.07	2.00	1.26	2.00	1.48	1.50	2.07	1.06
Comparison Among Regions												
Status (Ranking)	1970	3	1	2	5	3	3	4	1	1	1	3
	1980	5	4	3	2	3	3	4	3	2	2	3
Improvement (Ranking)	1970-1980	5	5.5	4	1	4	3	3	6	3	5	4

Notes: Status ranking of 1 indicates that this region had the highest mortality rate among the six regions.
Improvement ranking of 1 indicates the least improvement.

TABLE 4.3

SUMMARY ANALYSES OF ELEVEN MORTALITY INDICATORS
U.S. REGION 2: MID RIO GRANDE

Comparative Indicators		Neonatal Mortality	Post-Neonatal Mortality	Maternal Mortality	External Mortality				Internal Mortality			
					Under 1	1-4	5-14	15-24	Under 1	1-4	5-14	15-24
Comparison with U.S.												
Status (Ratio to U.S.)	1970	0.93	0.90	1.29	0.96	0.82	1.09	0.89	1.11	0.77	0.69	0.86
	1980	0.75	0.78	2.49	0.00	0.50	0.64	0.93	0.91	1.90	0.78	1.38
Improvement (Ratio to U.S.)	70-80	1.25	1.69	0.30	2.22	3.06	2.09	-3.00	1.25	-2.43	0.70	-0.31
Comparison Among Regions												
Status (Ranking)	1970	1	5	3	2	5	2	5	2	6	6	4
	1980	3	5	1	6	6	6	3	2	1	3	1
Improvement (Ranking)	70-80	3	4	1	6	6	5	2	3.5	1	2	2

Notes: Status ranking of 1 indicates that this region had the highest rate among the six regions.
Improvement ranking of 1 indicates the least improvement.

TABLE 4.4

SUMMARY ANALYSES OF ELEVEN MORTALITY INDICATORS
U.S. REGION 3: EL PASO

Comparative Indicators		Neonatal Mortality	Post-Neonatal Mortality	Maternal Mortality	External Mortality				Internal Mortality			
					Under 1	1-4	5-14	15-24	Under 1	1-4	5-14	15-24
Comparison with U.S.												
Status	1970	0.92	0.84	1.00	0.67	0.71	0.96	1.05	0.98	1.19	1.24	1.00
(Ratio to U.S.)	1980	0.75	0.93	1.10	0.51	0.97	0.83	0.85	0.84	0.82	0.62	0.82
Improvement (Ratio to U.S.)	70-80	1.23	0.44	0.93	1.29	-1.00	1.43	19.00	1.20	1.73	2.17	1.38
Comparison Among Regions												
Status (Ranking)	1970	2	6	4	6	6	4	3	3	3	2	2
	1980	2	3	2	5	4	5	6	4	3	6	5
Improvement (Ranking)	70-80	2	1	3	5	1	4	5	2	4	6	5.5

Notes: Status ranking of 1 indicates that this region had the highest rate among the six regions.
Improvement ranking of 1 indicates the least improvement.

TABLE 4.5

SUMMARY ANALYSES OF ELEVEN MORTALITY INDICATORS
U.S. REGION 4: NOGALES

Comparative Indicators		Neonatal Mortality	Post-Neonatal Mortality	Maternal Mortality	External Mortality				Internal Mortality			
					Under 1	1-4	5-14	15-24	Under 1	1-4	5-14	15-24
Comparison with U.S.												
Status (Ratio to U.S.)	1970	0.87	1.00	1.76	0.89	1.86	0.94	1.23	0.88	1.23	1.04	1.05
	1980	0.68	0.66	0.00	0.71	1.85	1.24	0.95	0.70	0.54	0.75	0.88
Improvement (Ratio to U.S.)	1970-1980	1.27	3.00	1.75	1.24	1.06	-0.09	24.00	1.30	2.30	1.63	1.38(((Rat
Comparison Among Regions												
Status (Ranking)	1970	4	3	1	3	2	5	2	5	2	4	1
	1980	4	6	5.5	4	2	1	2	6	5	4	4
Improvement (Ranking)	70-80	4	5.5	5	4	2	1	6	5	6	3	5.5

Notes: Status ranking of 1 indicates that this region had the highest rate among the six regions.
Improvement ranking of 1 indicates the least improvement.

TABLE 4.6

SUMMARY ANALYSES OF ELEVEN MORTALITY INDICATORS
U.S. REGION 5: IMPERIAL

					External Mortality				Internal Mortality			
Comparative Indicators		Neonatal Mortality	Post-Neonatal Mortality	Maternal Mortality	Under 1	1-4	5-14	15-24	Under 1	1-4	5-14	15-24
Comparison with U.S.												
Status (Ratio to U.S.)	1970	0.78	1.06	0.00	1.55	3.39	1.75	1.59	0.90	0.79	1.13	0.46
	1980	0.59	1.02	0.00	2.02	2.39	0.89	1.56	0.75	0.45	0.65	1.06
Improvement (Ratio to U.S.)	1970-1980	1.32	1.19	0.00	0.62	2.56	2.65	3.00	1.25	2.00	1.97	-1.78
Comparison Among Regions												
Status (Ranking)	1970	6	2	6	1	1	1	1	4	4	3	6
	1980	6	1	5.5	1	1	2	1	5	6	5	2
Improvement (Ranking)	1970-1980	6	3	6	2	5	6	4	3.5	5	4	1

Notes: Status ranking of 1 indicates that this region had the highest rate among the six regions.
Improvement ranking of 1 indicates the least improvement.

TABLE 4.7

SUMMARY OF ANALYSES OF ELEVEN MORTALITY INDICATORS
U.S. REGION 6: SAN DIEGO

Comparative Indicators		Neonatal Mortality	Post-Neonatal Mortality	Maternal Mortality	External Mortality				Internal Mortality			
					Under 1	1-4	5-14	15-24	Under 1	1-4	5-14	15-24
Comparison with U.S.												
Status (Ratio to U.S.)	1970	0.87	0.94	0.57	0.76	1.12	0.82	0.79	0.88	0.78	0.95	0.69
	1980	0.85	1.02	0.71	0.84	0.96	0.89	0.90	0.94	0.81	1.17	0.68
Improvement (Ratio to U.S.)	1970-1980	1.02	0.56	0.82	0.87	1.75	0.70	-14.00	0.90	0.93	0.43	1.03
Comparison Among Regions												
Status (Ranking)	1970	5	4	5	4	4	6	6	6	5	5	5
	1980	1	2	4	3	5	4	5	1	4	1	6
Improvement (Ranking)	1970-1980	1	2	2	3	3	2	1	1	2	1	3

Notes: Status ranking of 1 indicates that this region had the highest rate among the six regions.
Improvement ranking of 1 indicates the least improvement.

TABLE 4.8

SUMMARY ANALYSES OF ELEVEN MORTALITY INDICATORS
U.S. BORDER TOTAL

Comparative Indicators		Neonatal Mortality	Post-Neonatal Mortality	Maternal Mortality	External Mortality				Internal Mortality			
					Under 1	1-4	5-14	15-24	Under 1	1-4	5-14	15-24
Comparison with U.S.												
Status (Ratio to U.S.)	1970	0.89	1.00	0.96	0.81	1.29	0.95	0.94	0.96	1.07	1.14	0.81
	1980	0.76	0.90	0.74	0.88	1.16	0.92	0.94	0.87	0.93	0.94	0.80
Improvement (Ratio to U.S.)	1970-1980	1.16	1.50	1.18	0.89	1.56	1.09	1.00	1.15	1.33	1.40	1.03

TABLE 4.9

AREAS OF CONCERN IN MATERNAL AND CHILD HEALTH BASED ON ELEVEN MORTALITY INDICATORS

			1970-1980
Region 1:	Lower Rio Grande	--External causes of mortality, under 1	(+,**)
		--Internal causes of death, ages 1-4 & 5-14	(+,0)
Region 2:	Mid Rio Grande	--Maternal mortality	(++,*)
		--Internal causes of mortality, ages 1-4	(++,**)
		--Internal causes of mortality, ages 15-24	(+,**)
		--Internal causes of mortality, ages 5-14	(0,*)
		--External causes of mortality, ages 15-24	(0,**)
Region 3:	El Paso	--Maternal mortality	(+,**)
		--External causes of mortality, ages 1-4	(0,**)
Region 4:	Nogales	--External causes of mortality, ages 5-14	(+,**)
		--External causes of mortality, ages 1-4	(++,0)
Region 5:	Imperial	--Internal causes of mortality, ages 15-24	(+,**)
		--External causes of mortality, under 1	(++,*)
		--External causes of mortality, ages 1-4	(++,0)
		--External causes of mortality, ages 15-24	(++,0)
		--Post-neonatal mortality	(+,0)
Region 6:	San Diego	--Post-neonatal mortality	(+,*)
		--Maternal mortality	(0,*)
		--Internal causes of mortality, ages 5-14	(+,*)
		--Internal causes of mortality, under 1 & 1-4	(0,*)
		--External causes of mortality, ages 15-24	(0,**)
		--External causes of mortality, age under 1	(0,*)

1980 Mortality Status:
++ Much worse than U.S. (Ratio ≥1.50)
+ Worse than U.S. (Ratio 1.01-1.49)
0 Same or better than U.S.

1970-80 Improvement Status:
** Deterioration
* Improvement slower than U.S.
0 Improvement faster than U.S.

TABLE 4.10

CAUSES OF DEATH - NINTH REVISION OF ICD CODES

Causes of Death	Ninth Revision ICD Codes
Enteritis & other diarrheal diseases	007 - 009
Tuberculosis, all forms	010 - 018
Whooping cough	033
Meningococcal infections	036
Septicemia	038
Acute poliomyelitis	045
Measles	055
Syphilis & its sequelae	090 - 097
Total infective & parasitic diseases	001 - 139
Malignant neoplasms	140 - 208
Benign neoplasms	210 - 239
Diabetes mellitus	250
Avitaminoses & other nutritional deficiencies	260 - 269
Meningitis	320 - 322
Diseases of circulatory system	390 - 448
Pneumonia	480 - 486
Complications of pregnancy, birth & puerperium	630 - 676
Congenital anomalies	740 - 759
Diseases of early infancy	760 - 779
Symptoms & ill-defined conditions	780 - 799
All other diseases	Residual
External causes	800 - 999

TABLE 4.11

LEADING CAUSES OF DEATH, PRINCIPAL BORDER COUNTIES COMBINED, UNDER 1 YEAR

	1970					1980			
Cause of Death	Number of Deaths	Cumulative %	Rate*	Ratio+	Cause of Death	Number of Deaths	Cumulative %	Rate*	Ratio+
Diseases of early infancy and ill-defined conditions	591	55.6	1143.0	0.85	Diseases of early infancy and ill-defined conditions	446	59.5	665.2	0.82
Congenital anomalies	175	72.1	338.4	1.05	Congenital anomalies	172	82.5	256.5	0.98
Pneumonia	88	80.3	170.2	0.95	Accidents & external causes	24	85.7	35.8	0.88
Accidents & external causes	31	83.3	60.0	0.81	Circulatory system diseases	15	87.7	22.4	0.81
Enteritis & diarrheal diseases	26	85.7	50.3	2.06	Pneumonia	13	89.5	19.4	0.69
Meningitis	13	86.9	25.1	1.49	Meningitis	10	90.8	14.9	1.19
Septicemia	11	88.0	21.3	0.86	Septicemia	8	91.9	11.9	1.75
Dis of circulatory system	10	88.9	19.3	1.01	Malignant neoplasm	7	92.8	10.4	3.25
Avitaminoses & nutritional deficiencies	6	89.5	11.6	2.47	Meningococcal infection	2	93.1	3.0	1.36

* Mortality rate per 100,000 population in age cohort.

+ Standardized mortality ratio of the border's rate to the national rate.

Note: Total infective and parasitic diseases and other diseases categories not used in the ranking.

TABLE 4.12

LEADING CAUSES OF DEATH, PRINCIPAL BORDER COUNTIES COMBINED, AGES 1 - 4

1970					1980				
Cause of Death	Number	Cum %	Rate*	Ratio+	Cause of Death	Number	Cum %	Rate*	Ratio+
Accidents & external causes	85	45.7	44.9	1.30	Accidents & external causes	81	51.3	33.7	1.15
Congenital anomalies	19	55.9	10.0	1.03	Congenital anomalies	11	58.2	4.6	0.58
Malignant neoplasms	14	63.4	7.4	0.99	Malignant neoplasms	8	63.3	3.3	0.73
Pneumonia	13	70.4	6.8	0.93	Dis circulatory system	8	68.4	3.3	1.03
Measles	6	73.7	3.2	10.67	Pneumonia	6	72.2	2.5	1.25
Dis circulatory system	4	75.8	2.1	0.75	Ill-defined conditions	6	75.9	2.5	1.19
Tuberculosis, all forms	3	77.4	1.6	5.33	Meningitis	2	77.2	0.8	0.47
Ill-defined conditions	3	79.0	1.6	0.76					
Septicemia	2	80.1	1.1	2.20					

* Mortality rate per 100,000 population in age cohort.

+ Standardized mortality ratio, U.S. rates as standard.

Note: Total infective and parasitic diseases and other diseases categories not used in the ranking.

TABLE 4.13

LEADING CAUSES OF DEATH, PRINCIPAL BORDER COUNTIES COMBINED, AGES 5 - 14

1970					1980				
Cause of Death	Number	Cumulative %	Rate*	Ratio+	Cause of Death	Number	Cumulative %	Rate*	Ratio+
Accident & external causes	117	48.0	20.1	1.00	Accident & external causes	96	54.2	13.2	0.92
Malignant neoplasms	39	63.9	6.9	1.15	Malignant neoplasms	39	76.3	6.3	1.47
Congenital anomalies	20	72.1	3.5	1.59	Congenital anomalies	9	81.4	1.4	0.88
Pneumonia	12	77.0	2.1	1.40	Dis of circulatory system	5	84.2	0.8	0.62
Dis of circulatory system	8	80.3	1.4	0.88	Pneumonia	2	85.3	0.3	0.60
Ill-defined conditions	4	82.0	0.7	1.40	Meningitis	1	85.9	0.2	2.00
Meningococcal infection	2	82.8	0.4	2.00	Ill-defined conditions	1	86.4	0.2	0.50
Septicemia	2	83.6	0.4	4.00					
Benign neoplasm	2	84.4	0.4	1.00					

* Mortality rate per 100,000 population in age cohort.

+ Standardized mortality ratio of the border's rate to the national rate.

Note: Total infective and parasitic diseases and other diseases categories not used in the ranking.

TABLE 4.14

LEADING CAUSES OF DEATH, PRINCIPAL BORDER COUNTIES COMBINED, AGES 15 - 24

	1970					1980			
Cause of Death	Number	Cumulative %	Rate*	Ratio+	Cause of Death	Number	Cumulative %	Rate*	Ratio+
Accident & external causes	493	75.2	86.5	0.94	Accident & external causes	677	81.6	85.6	0.86
Malignant neoplasms	40	81.2	7.0	0.84	Malignant neoplasms	32	85.4	4.0	0.65
Pneumonia	17	83.8	3.0	1.30	Dis of circulatory system	19	87.7	2.4	0.62
Dis of circulatory system	14	86.0	2.5	0.51	Congenital anomalies	12	89.2	1.5	1.07
Congenital anomalies	10	87.5	1.8	0.86	Ill-defined conditions	10	90.4	1.3	0.62
Meningococcal infections	7	88.6	1.2	4.00	Septicemia	6	91.1	0.8	4.00
Ill-defined conditions	6	89.5	1.1	0.52	Pneumonia	6	91.8	0.8	1.00
Complications of pregnancy, childbirth, and puerperium	2	89.8	0.4	0.44	Benign neoplasms	1	91.9	0.1	0.33

* Mortality rate per 100,000 population in age cohort.

+ Standardized mortality ratio of the border's rate to the national rate.

Note: Total infective and parasitic diseases and other diseases categories not used in the ranking.

TABLE 4.15

U.S.-MEXICO BORDER MATERNAL AND CHILD HEALTH
CAUSES OF DEATH BY 1980 MORTALITY STATUS AND 1970 TO 1980 IMPROVEMENT STATUS
REGION 1: CAMERON AND HIDALGO COUNTIES

1970-1980 Improvement Status	1980 Mortality Status		
	Much Worse Than U.S. (Ratio ≥ 1.50) ++	Worse Than U.S. (Ratio 1.01-1.49) +	Equal to or Better than U.S. (Ratio ≤ 1.00) 0
Deterioration **	Malig neoplasm, <1, 1-4, 5-14 Meningitis, <1, 5-14 Septicemia, 1-4, 15-24 Other diseases, 1-4 Ill-defined symp, 15-24	External causes, under 1	Dis circulatory sys, <1,15-24 Congenital anom, <1, 15-24
Improvement Slower than U.S. *	Septicemia, under 1 Infect & Paras, 15-24	Pneumonia, 1-4	Malignant neoplasm, 15-24 Other diseases, under 1
Improvement Faster than U.S. 0	Dis circulatory sys, 1-4 Ill-defined symp, 1-4, 15-14	Infect & Paras, under 1 Pneumonia, 15-24	Infect & paras, 1-4, 5-14 Benign neoplasm, 5-14, 15-24 Diabetes mellitis, 15-24 Dis circulatory sys, 5-14 Pneumonia, <1, 5-14 Congenital anom, 1-4, 5-14 Dis early infancy, under 1 External, 1-4, 5-14, 15-24 Neonatal Post-neonatal Maternal

TABLE 4.16

U.S.-MEXICO BORDER MATERNAL AND CHILD HEALTH
CAUSES OF DEATH BY 1980 MORTALITY STATUS AND 1970 TO 1980 IMPROVEMENT STATUS
REGION 2: WEBB, MAVERICK, VAL VERDE COUNTIES

	1980 Mortality Status		
Improvement Status	Much Worse Than U.S. (Ratio ≥ 1.50) ++	Worse Than U.S. (Ratio 1.01-1.49) +	Equal to or Better than U.S. (Ratio ≤ 1.00) 0
Deterioration **	Other diseases, <1, 1-4, 15-24 Malig neoplasm, 1-4 Dis circulatory sys, 1-4 Pneumonia, 1-4 Infect & paras, 5-14, 15-24 Septicemia, 15-24 Diabetes mellitus, 15-24	Malig neoplasm, 15-24	Congenital anom, under 1 Other diseases, 5-14 External causes, 15-24
Improvement Slower than U.S. *	Enteritis & diar, <1 Infect & paras, <1 Maternal		Malig neoplasm, 5-14
Improvement Faster than U.S. 0	Pneumonia, under 1, 15-24 Congenital anom, 1-4, 5-14		Septicemia, under 1 Malig neoplasm, under 1 Benign neoplasm, 5-14 Meningitis, under 1 Dis circulatory sys, 15-24 Dis early infancy, under 1 Ill-defined syjp, 1-4, 15-24 External, <1, 1-4, 5-14 Neonatal Post-neonatal

TABLE 4.17

U.S.-MEXICO BORDER MATERNAL AND CHILD HEALTH
CAUSES OF DEATH BY 1980 MORTALITY STATUS AND 1970 TO 1980 IMPROVEMENT STATUS
REGION 3: EL PASO COUNTY

Improvement Status	1980 Mortality Status		
	Much Worse Than U.S. (Ratio ≥ 1.50) ++	Worse Than U.S. (Ratio 1.01-1.49) +	Equal to or Better than U.S. (Ratio ≤ 1.00) 0
Deterioration **	Meningococcal inf, <1 Benign neoplasm, <1 Septicemia, 15-24	Other diseases, < 1 Ill-defined symp, 1-4 Dis circulatory sys, 15-24	External Causes, 1-4
Improvement Slower than U.S. *	Infect & paras, <1	Pneumonia, 1-4 Other diseases, 15-24 Maternal	Malig neoplasm, 1-4 Congenital anom, 5-14
Improvement Faster than U.S. 0	Septicemia, under 1 Dis circulatory sys, <1 Other diseases, 1-4 Malig neoplasm, 5-14	Infect & paras, 15-24	Enteritis & diar, <1 T.B., all forms, <1, 1-4 Septicemia, 5-14 Infect & paras, 1-4, 5-14 Nutritional defic, <1 Meningitis, under 1 Dis circulatory sys, 1-4, 5-14 Pneumonia, <1, 1-4, 15-24 Congenital anom, <1, 1-4, 15-24 Dis early infancy, under 1 Other diseases, 5-14 External causes, <1, 5-14 Neonatal Post-neonatal

TABLE 4.18

U.S.-MEXICO BORDER MATERNAL AND CHILD HEALTH
CAUSES OF DEATH BY 1980 MORTALITY STATUS AND 1970 TO 1980 IMPROVEMENT STATUS
REGION 4: COCHISE, SANTA CRUZ, PIMA COUNTIES

Improvement Status		1980 Mortality Status	
	Much Worse Than U.S. (Ratio ≥ 1.50) ++	Worse Than U.S. (Ratio 1.01-1.49) +	Equal to or Better than U.S. (Ratio ≤ 1.00) 0
Deterioration **	Septicemia, 15-24 Infect & paras, 15-24	Ill-defined symp, 1-4 Malig neoplasm, 5-14 Other diseases, 5-14 External causes, 5-14	Dis circulatory sys, 1-4 Ill-defined symp, 15-24
Improvement Slower than U.S. *	Septicemia, under 1 Pneumonia, under 1, 15-24 Congenital anom, 15-24 Other diseases, 15-24		
Improvement Faster than U.S. 0	External causes, 1-4	Pneumonia, 1-4 Other Diseases, <1, 1-4 External, <1, 15-24 Maternal Neonatal Post-neonatal	Enteritis & diarr, under 1 Meningco infect, under 1 Infect & paras, <1, 1-4, 5-14 Malig neoplasm, 1-4, 15-24 Benign neoplasm, 1-4 Nutri defic, under 1 Meningitis, under 1 Dis circul sys, <1, 5-14, 15-24 Pneumonia, 5-14 Congen anom, <1, 1-4, 5-14 Dis early infancy, <1 Ill-defined symp, 5-14

TABLE 4.19

U.S.-MEXICO BORDER MATERNAL AND CHILD HEALTH
CAUSES OF DEATH BY 1980 MORTALITY STATUS AND 1970 TO 1980 IMPROVEMENT STATUS
REGION 5: YUMA AND IMPERIAL COUNTIES

Improvement Status		1980 Mortality Status		
		Much Worse Than U.S. (Ratio ≥ 1.50) ++	Worse Than U.S. (Ratio 1.01-1.49) +	Equal to or Better than U.S. (Ratio ≤ 1.00) 0
Deterioration	**	Septicemia, Under 1 Malig Neoplasm, Under 1 5-14 Meningitis, Under 1 Other Diseases, 1-4, 5-14	Infect & Paras, Under 1 Malig Neoplasm, 15-24 Ill-defined Symp, 15-24	
Improvement Slower than U.S.	*	External Causes, Under 1	Other Diseases, Under 1	
Improvement Faster than U.S.	0	External causes, 1-4, 15-24	Congenital Anom, Under 1 Post-neonatal	Infect & Paras, 5-14 Malig Neoplasm, 1-4 Dis Circulatory Sys, 15-24 Pneumonia, Under 1, 1-4 Congenital Anom, 1-4 Dis Early Infancy, Under 1 Pneumonia, Under 1, 1-4 Congenital Anom, 1-4 Dis Early Infancy, Under 1 Ill-defined Symp, 5-14 Other Diseases, 5-14 External Causes, 5-14 Maternal Neonatal

TABLE 4.20

U.S.-MEXICO BORDER MATERNAL AND CHILD HEALTH
CAUSES OF DEATH BY 1980 MORTALITY STATUS AND 1970 TO 1980 IMPROVEMENT STATUS
REGION 6: SAN DIEGO COUNTY

Improvement Status	1980 Mortality Status		
	Much Worse Than U.S. (Ratio ≥ 1.50) ++	Worse Than U.S. (Ratio 1.01-1.49) +	Equal to or Better than U.S. (Ratio ≤ 1.00) 0
Deterioration **	Diabetes mellitus, 1-4 Dis circulatory sys, 5-14	Infect & paras, under 1 Malig neoplasm, under 1 Meningitis, 1-4 Congenital anom, 15-24	Septicemia, under 1, 15-24 Dis circulatory sys, 1-4, 15-24 Ill-defined cond, 1-4 Other diseases, 1-4, 5-14 Benign neoplasm, 15-24 External causes, 15-24
Improvement Slower than U.S. *	Meningitis, under 1 Infect & paras, 5-14 Pneumonia, 5-14 Congenital anom, 5-14	Malig neoplasm, 5-14 Post-neonatal	Dis early infancy, under 1 External causes, under 1, 5-14 Pneumonia, 1-4 Diabetes mellitus, 15-24 Other diseases, 15-24 Maternal
Improvement Faster than U.S. 0	Mening. infect, <1	Infect & paras, 1-4 Congenital Anom, <1, 1-4 Ill-defined symp, 15-24 Other disease, <1 External causes, 1-4 Neonatal	Enteritis & diar, <1, 15-24 T.B., all aforms, 1-4 Mening infect, 5-14, 15-24 Septicemia, 1-4 Infect & paras, 15-24 Malig neoplasm, 1-4, 15-24 Benign neoplasm, under 1 Meningitis, 5-14 Dis circulatory sys, under 1 Pneumonia, under 1, 15-24

TABLE 4.21

U.S.-MEXICO BORDER MATERNAL AND CHILD HEALTH
CAUSES OF DEATH BY 1980 MORTALITY STATUS AND 1970 TO 1980 IMPROVEMENT STATUS
PRINCIPAL BORDER COUNTIES AS A WHOLE

Improvement Status		1980 Mortality Status		
		Much Worse Than U.S. (Ratio ≥ 1.50) ++	Worse Than U.S. (Ratio 1.01-1.49) +	Equal to or Better than U.S. (Ratio ≤ 1.00) 0
Deterioration	**	Septicemia, 15-24 Malig neoplasm, under 1	Diabetes mellitus, 1-4 Other diseases, 1-4	Meningitis, 1-4 Dis circulatory sys, 1-4 Ill-defined symp, 1-4
Improvement Slower than U.S.	*	Septicemia, under 1 Malig neoplasm, 5-14 Benign neoplasm, under 1 Meningitis, 5-14	Pneumonia, 1-4 Congenital anom, 15-24 Other diseases, 15-24	Diabetes mellitus, 15-24 Dis circulatory sys, 15-24 External causes, under 1
Improvement Faster than U.S.	0		Meningococcal inf, <1 Infect & paras dis, <1, 15-24 Meningitis, under 1 External causes, 1-4	Remaining indicators not listed here.

TABLE 4.22

SELECTED MORTALITY INDICATORS FOR MATERNAL AND CHILD HEATLH FOR U.S. AND MEXICO BORDER REGIONS

Column:		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Calculation:				[1÷2]			[4÷5]	[4÷1]	[5÷2]
		U.S.A.			MEXICO			Ratio of Mexico/U.S	
Mortality Indicators	Year	Border Regions[A]	Nation	Ratio[C]	Border States[B]	Nation	Ratio[C]	Border	Nation
Maternal Death Rate Per 100,000 Live Births	70	20.6	21.5	0.96	99.0	143.0	0.69	4.8	6.7
	74	12.2	14.6	0.84	70.9	110.6	0.64	5.8	7.6
Percent Change[C]		-40.7	-32.1	1.27	-28.4	-22.7	1.25	0.7	0.7
Neonatal Death Rate Per 1,000 Live Births	76	13.4	10.9	1.23	13.6	19.8	0.69	1.0	1.8
Infant Death Rate Per 1,000 Live Births	70	18.3	20.0	0.92	62.6	68.5	0.91	3.4	3.4
	76	12.9	15.2	0.85	44.7	52.0	0.86	3.5	3.4
Percent Change[C]		-29.5	-24.0	1.23	-28.6	-24.1	1.19	1.0	1.0
Death Rate For 1-4 Years Per 100,000 In Cohort[D]	70	98.1	84.5	1.16	584.8	1,090.0	0.54	6.0	12.9
	76	69.6	69.9	1.00	226.1	486.0	0.47	3.2	7.0
Percent Change[C]		-29.1	-17.3	1.68	-61.3	-55.4	1.11	2.1	3.2

TABLE 4.22 (Cont.)

Column:		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Calculation:				[1÷2]			[4÷5]	[4÷1]	[5÷2]
		U.S.A.			Mexico			Ratio of Mexico/U.S.	
Mortality Indicators	Year	Border Regions[A]	Nation	Ratio[C]	Border States[B]	Nation	Ratio[C]	Border	Nation
Death Rate for Years 5-14 Per 100,000 In Cohort[D]	70	42.9	41.3	1.04	82.9	162.0	0.51	1.9	3.9
	76	31.8	34.7	0.92	60.7	101.0	0.60	1.9	2.9
Percent Change[C]		-25.9	-16.0	1.62	-26.8	-37.7	0.71	1.0	2.4
Death Rate for Years 15-24 Per 100,000 in Cohort[D]	70	115.0	127.7	0.90	205.8	214.0	0.96	1.8	1.7
	76	114.4	113.5	1.01	145.3	182.0	0.80	1.3	1.6
		-0.5	-11.1	0.05	-29.4	-15.0	1.96	58.8	1.4

Sources: Censo de México, 1970 and 1980.
Data tapes from the respective state health departments in the U.S.
Secretaria de Salubridad y Asistencia, Compendio de Estadísticas Vitales de Mexico, 1976.
Secretaria de Salubridad y Asistencia, Estadísticas Vitales, 1974.
Secretaria de Salubridad y Asistencia, Estadísticas Vitales, Demográficas y de Recursos en la Republica Mexicana, 1968-1973.
U.S. Census, 1970 and 1980.

Notes:
A. Twelve principal border counties combined.
B. Six Mexican border states combined.
C. Percent change in rates over given time period. Final columns reflect ratio of Mexico's percent change to U.S. percent change.
D. Population estimated by linear interpolation between census years.

TABLE 4.23

AGE DISTRIBUTION OF INFANT DEATHS OCCURRING IN LAREDO AND NUEVO LAREDO, 1980-82

	< 1 day	1-6 days	7-27 days	28 days-1 year	Total
Laredo	29 38%	22 29%	7 9%	19 25%	77 100%
Nuevo Laredo	21 4%	162 29%	62 11%	322 57%	567 100%

Source: Alfonso Ortiz, Comparative Study of Infant Mortality in the Texas-Mexico Border Area of Laredo/Nuevo Laredo, Working Paper No. 29 (Austin: Lyndon B. Johnson School of Public Affairs, 1984).

TABLE 4.24

INFANT MORTALITY

Place of Residence and Place of Occurrence in Laredo
Place of Occurrence in Nuevo Laredo
1980-82

	Laredo		Nuevo Laredo
	Residence	Occurrence	Occurrence
Live Births	7,955	10,796	15,268
Infant Deaths	75	77	567
Rate/1,000	9.4	7.1	37.1
Neonatal Deaths	51	57	245
Rate/1,000	6.4	5.3	16.0
Post-Neonatal Deaths	24	20	322
Rate/1,000	3.0	1.9	21.1

Source: Alfonso Ortiz, Comparative Study of Infant Mortality in the Texas-Mexico Border Area of Laredo/Nuevo Laredo, Working Paper No. 29 (Austin: Lyndon B. Johnson School of Public Affairs, 1984.)

TABLE 4.25

CAUSES OF INFANT DEATHS OCCURRING IN NUEVO LAREDO AND LAREDO, 1980-82

	Nuevo Laredo			Laredo		
Case (ICD-9)[A]	#	%	Rank	#	%	Rank
Bronchitis and pneumonia (485-486)	131	23.1	1	2	2.6	5.5
Respiratory distress syndrome (769)	128	22.6	2	22	28.6	1.5
Symptoms, signs, ill-defined conditions (780-799)	55	9.7	3	4	5.2	4
Non-infectious gastroentoritis (558)	50	8.8	4	-	-	-
Intestinal infectious diseases (001-009)	44	7.8	5	-	-	-
Other causes originating in the perinatal period (760-764, 766-768, 770-779)[B]	35	6.2	6	22	28.6	1.5
Congenital anomalies (740-759)	23	4.1	7.5	13	16.9	3
Immaturity (765)	23	4.1	7.5	1	1.3	8.5
Malnutrition of the third degree (262)	17	3.0	9	-	-	-
Other respirtatory diseases (460-484,487-519)[C]	8	1.4	10.5	2	2.6	5.5
Other endocrine, nutritional, metabolic diseases (240-261,263-279)[D]	8	1.4	10.5	1	1.3	8.5
Burns (800-829)	4	0.7	12	-	-	-
Meningitis of unspecified cause (322)	3	0.5	14	1	1.3	8.5
Fractures (940-949)	3	0.5	14	-	-	-
Tuberculosis (010-018)	3	0.5	14	-	-	-
Other infectious and parasitic diseases (019-139)[E]	2	0.4	16.5	1	1.3	8.5
Bacterial meningitis (320)	2	0.4	16.5	-	-	-
Other causes not listed above	28	4.9	-	8	10.4	-
TOTAL	567	100		77	100	

Source: Alfonso Ortiz, Comparative Study of Infant Mortality in the Texas-Mexico Border Area of Laredo/Nuevo Laredo, Working Paper 29 (Austin: Lyndon B. Johnson School of Public Affairs, 1984).

Notes:
A. Categories were selected prior to data collection. Categories were selected to focus on infant health issues.
B. Excludes immaturity (765) and respiratory distress syndrome (769), which are presented separately.
C. Excludes bronchitis and pneumonia (485-486), which is presented separately.
D. Excludes malnutrition of third degree (262), which is presented separately.
E. Excludes intestinal infectious diseases (001-009) and tuberculosis (010-018), which are presented separately.

TABLE 4.26

CAUSES OF POST-NEONATAL DEATHS OCCURRING IN NUEVO LAREDO AND LAREDO, 1980-82

Case (ICD-9)[A]	Nuevo Laredo			Laredo		
	#	%	Rank	#	%	Rank
Bronchitis and pneumonia (485-486)	101	31.4	1	2	10.0	3.5
Respiratory distress syndrome (769)	6	1.9	9	1	5.0	7
Symptoms, signs, ill-defined conditions (780-799)	48	14.9	2	3	15.0	1.5
Non-infectious gastroenteritis (558)	43	13.4	3	-	-	-
Intestinal infectious diseases (001-009)	40	12.4	4	-	-	-
Other causes originating in the perinatal period (760-764, 766-768, 770-779)[B]	5	1.6	10	3	15.0	1.5
Congenital Anomalies (740-759)	10	3.1	6	1	5.0	7
Immaturity (765)	2	0.6	16	-	-	-
Malnutrition of the third degree (262)	17	5.3	5	-	-	-
Other respiratory diseases (460-484, 487-519)[C]	8	2.5	7	2	10.0	3.5
Other endocrine, nutritional, metabolic diseases (240-261, 263-279)[D]	7	2.2	8	1	5.0	7
Burns (800-829)	3	0.9	12.5	-	-	-
Meningitis of unspecified cause (322)	3	0.9	12.5	1	5.0	7
Fractures (940-949)	3	0.9	12.5	-	-	-
Tuberculosis (010-018)	3	0.9	12.5	-	-	-
Other infectious and parasitic diseases (019-139)[E]	2	0.6	16	1	5.0	7
Bacterial Meningitis (320)	2	0.6	16	-	-	-
Other causes not listed above	19	5.9	-	5	25.0	-
TOTAL	322	100		20	100	

Source: Alfonso Ortiz, Comparative Study of Infant Mortality in the Texas-Mexico Border Area of Laredo/Nuevo Laredo, Working Paper 29 (Austin: Lyndon B. Johnson School of Public Affairs, 1984).

Notes:
- A. Categories were selected prior to data collection. Categories were selected to focus on infant health issues.
- B. Excludes immaturity (765) and respiratory distress syndrome (769), which are presented separately.
- C. Excludes bronchitis and pneumonia (485-486), which is presented separately.
- D. Excludes malnutrition of third degree (262), which is presented separately.
- E. Excludes intestinal infectious diseases (001-009) and tuberculosis (010-018), which are presented separately.

CHAPTER 5

COMMUNICABLE DISEASES

Statistical data about the presence of communicable diseases on the border are of limited accuracy for a number of reasons. First, the relatively low socio-economic status of much of the population on both sides of the border probably limits access to treatment, resulting in self-treatment and failure to document some cases of communicable disease. Also, many border residents use traditional healers, which may lead to some undercounting of reportable diseases. On the other hand, because public health agencies tend to be more active in lower income areas, they may be more likely to identify cases in those neighborhoods than in wealthier areas, where private physicians are more likely to be consulted. The resources of the respective local public health agencies also affect reporting of diseases. A well-funded health department might be expected to generate more disease counts than a less-funded department in a similar community.

In Mexico, the problems associated with communicable disease data become more complicated. First the enormous poverty among much of the population substantially contributes to self-treatment and consequently to lack of reporting. Further, public health agencies in Mexico do not have the resources that are available for public health on the U.S. side of the border. Thus, priority is more likely to be given to providing services over keeping counts of communicable diseases. Also, public health authorities in Mexico are less likely to have laboratory resources for verification of reported diseases. Cases might be excluded from the statistics because the laboratory criteria are not met, or non-cases might be counted without laboratory verification.

Interaction across the border further limits the accuracy of communicable disease data. There exists a certain amount of cross-border migration for treatment which would tend to shift counts to opposite sides of the border -- if those cases are counted at all. For example, many drugs that are obtained in this country by prescription are available at the farmacia (pharmacy) in Mexico without prior consultation with a physician. Such access to medicines facilitates self-treatment for residents on both sides of the border. Also, because physician services are less expensive in Mexico, it is very common for lower income residents on the U.S. side to cross into Mexico for medical care.

Because of these and other limitations of the data contained in this report, the reader is advised to exercise extreme caution in drawing any conclusions. All findings in this report are tentative and need verification by physicians and public health workers in the field.

5.1 Methodology

This paper examines the reported numbers of cases and rates per 100,000 population for ten diseases in border counties and municipios for the years 1970 and 1975 through 1980. The tables are by no means complete since much of the desired information was not located. Further, some of the diseases are not of direct importance to maternal and child health. However, they have value in orienting the reader to general health status on the border. Sources include the respective state agencies and, in some instances, local health departments on this side of the border. Substantial information on both sides of the border was found in the Border Epidemiological Bulletin published by the Pan American Health Organization's El Paso Field Office. Generous assistance was given by the Unidad de Informacion, Servicios Coordinados de Salud Publica en los Estados in Mexico City. The rest of the figures on Mexico were acquired from various publications and, at times, from state and local health authorities in Mexico.

Populations for the respective counties and municipios as well as the states on both sides of the border were obtained from the 1970 and 1980 census reports. Populations for middle years were estimated by linear interpolation between census years. Because morbidity data usually could not be located for Rio Bravo, this community was excluded in the calculation of summary rates for the municipios.

Where data were complete, summary rates for the border counties for 1980 were compared with overall rates for the U.S. population. A chi-square test was applied to determine if rates for the border counties differ significantly from rates for the rest of the nation. Another set of calculations was performed to determine whether the reported rates for the border counties, as a group, differ from these for the border municipios. Results were considered significant at $p<0.001$. The statistical test treats cases as proportions of the total population and thus assumes, perhaps incorrectly, that each case in a given year represents a distinct individual. Also, the test is somewhat crude because the total population may include individuals not at risk of contracting the disease in question. For example, a more appropriate analysis of childhood diseases would exclude adults from the population at risk. Finally, the reader should consider that such statistical tools may not be appropriate because of the enormous potential for bias in the data.

5.2 Measles

In 1980, the 12 border counties reported 9.6 cases of measles per 100,000 population (table 5.1). This rate was significantly higher than the overall rate of 6.0 for the United States. Reports of measles have decreased dramatically over the last decade in the border counties and in the U.S. overall. However, in 1977, an outbreak occurred which affected most of the border counties. A similar outbreak is evident for the nation as a whole. Rates stayed comparatively low from 1978 through 1980.

The overall rate for the 11 border municipios in 1980 was not statistically different from the rate for the counties, although the border municipios clearly reported much lower rates than did Mexico as a whole. The 1977 outbreak of measles on the U.S. side of the border is evident in the border municipios as well as Mexico overall. Health authorities from Mexico report that lack of laboratory verification may have contributed to over-reporting of measles in Mexico. The effects of self-treatment and cross-border migration for care are unclear.

5.3 Rubella

In the border counties, reports of rubella decreased substantially since 1970 (table 5.2). The rate for Imperial County, however, has been consistently higher than the rates for the other counties. San Diego County reported a rather large number of cases (262) in 1977.

Information concerning rubella was not located for the municipios. However, data for the Mexican border states indicate that substantial numbers of cases were reported in each of the years studied.

5.4 Pertussis

Statistical data concerning pertussis were not located for all 12 counties (table 5.3). The counties for which data are available all showed substantial reductions in rates since 1970. However, the persistence of pertussis in Imperial County up through 1980 is cause for concern.

Although the reported rates for the Mexican border states and for Mexico as a whole are much higher than the rates for the counties, they have declined substantially since 1970. No data were located for the municipios.

5.5 Polio

A handful of cases of polio were reported in the border counties during the years studied (table 5.4). No cases were reported in the border municipios in 1980.

5.6 Amebiasis, Salmonellosis, and Shigellosis

Because the various intestinal diseases might not be accurately identified without laboratory analysis, the researchers constructed an index consisting of combined reports of amebiasis, salmonellosis, and shigellosis (table 5.5). The resulting data dramatize the problems of data reliability rather than those of enteric disease. In both the United States and Mexico, reports of these diseases have increased over the years. The increase probably does not result from increased presence of disease, but from increased recording and communication. Most, but not all, of the biases in the data would be expected to stem from depressed reporting in the border areas. However, summary rates for all 12 counties were consistently higher than the U.S. national rate. The 1980 total border county rate was significantly higher than the U.S. rate.

Rates for the various Mexican states differ so greatly that the researchers are inclined to dismiss the data entirely.

5.7 Infectious Hepatitis

The reported rate of 23.9 cases per 100,000 persons in the border counties in 1980 was significantly higher than the U.S. rate of 12.8 cases per 100,000 (table 5.6). The summary rate for the border counties was higher than the U.S. national rate for each year studied. While the national rate declined over the years, the overall county rate did not. The border municipios reported 17.1 cases of all forms of hepatitis per 100,000 population in 1980. This rate was lower than the rate for the counties or for Mexico as a whole. Over the time period studied, the rates for Mexico and the municipios increased. The effects of poor data reliability are unclear.

5.8 Tuberculosis

The 818 new cases of active tuberculosis reported in the border counties in 1980 constituted a rate of 21.4 cases per 100,000 persons (table 5.7). This rate was significantly higher than the United States rate of 12.3 cases per 100,000. The rate for the United States consistently decreased over the time period studied. While similar progress is evident in the counties, a relatively large number of cases were reported in 1980. Many of these were reported in San Diego and Pima counties, suggesting a relationship to Asian immigration to those areas.

Rates for Mexico and its border states include all forms of tuberculosis. The rates appear to have decreased in Mexico's border states and in Mexico as a whole.

5.9 Typhoid

The rate for typhoid reporting in the border counties was significantly higher than the United States national rate in 1980 (table 5.8), and was consistently higher in prior years. Sporadic outbreaks of five to eleven cases have occurred in different counties in different years.

The reported rate for the municipios in 1980 was significantly higher than the rate for the counties and was consistently higher in prior years. Reported sporadic outbreaks infected more than 40 people in several instances from 1977 through 1980.

5.10 Communicable Disease Summary

The border area presents some unique challenges to the collection and interpretation of morbidity data. Analysis is hampered by the effects of self-treatment, cross-border migration for treatment, undercounts, and even possible systematic overcounts of reported morbidity. Thus, findings may reflect the rates of reporting rather than the incidence of disease among the border populations.

In 1980, the border counties, in comparison to the rest of the United States, had significantly higher rates for measles, enteric diseases, infectious hepatitis, tuberculosis, and typhoid fever. The reported 1980 rates for the border municipios, in comparison to the border counties, were significantly higher for typhoid and lower for hepatitis, even though all forms of hepatitis were reported on the Mexican side of the border.

Measles rates are clearly down since 1970, although an outbreak occurred in 1977 which affected both sides of the border. Rubella and pertussis reports also decreased substantially since 1970. Imperial County, however, continues to exhibit residual rates for these two diseases which are somewhat higher than the rates for the other counties. Polio has become rare in the border counties and municipios.

Reported rates for intestinal diseases such as amebiasis, shigellosis, and salmonellosis have all increased on both sides of the border in recent years. It is likely that changing reporting practices influence these figures as much as or more than the actual presence of disease. Overall U.S. rates for infectious hepatitis and tuberculosis declined over each of the years studied. Corresponding decreases for the border counties are not evident.

TABLE 5.1

REPORTED MEASLES (SARAMPION) CASES AND RATE PER 100,000 PERSONS U.S. BORDER COUNTIES AND BORDER MUNICIPIOS

	1970		1975		1976		1977		1978		1979		1980	
County	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate
Cameron	191	136.1	8	4.6	8	4.4	28	14.8	6	3.1	5	2.5	4	1.9
Hidalgo	271	149.3	3	1.3	1	0.4	11	4.2	0	0	11	4.0	8	2.8
Webb	34	46.7	3	3.5	0	0	16	17.5	0.0	0.0	3	3.1	3	3.0
Maverick	10	55.1	1	4.0	0	0	0	0	5	17.4	0	0	1	3.2
Val Verde	47	171.1	1	3.2	0	0	14	41.9	0	0	0	0	0	.0
El Paso	42	11.7	1	0.2	13	3.0	89	20.1	5	1.1	14	3.0	12	2.5
Cochise	--	--	0	0	0	0	1	1.3	0	0	38	45.6	4	4.7
Santa Cruz	--	--	0	0	0	0	0	0	0	0	0	0	5	24.4
Pima	--	--	66	18.8	3	0.7	136	28.5	30	6.1	5	1.0	31	5.8
Yuma	--	--	0	0	1	1.3	16	19.6	1	1.2	0	0	1	1.1
Imperial	23	30.9	7	8.4	11	12.9	36	41.5	7	7.9	3	3.3	4	4.3
San Diego	96	7.1	109	6.8	116	7.0	698	40.8	71	4.0	166	9.2	294	15.8
Total 12 Counties	--	--	199	6.1	153	4.5	1,045	29.9	125	3.5	245	6.6	367	9.6
U.S.	--	23.2	--	11.4	--	19.2	--	26.5	--	12.3	--	6.2	--	6.0

TABLE 5.1 (Cont.)

	1970		1975		1976		1977		1978		1979		1980	
Municipio	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate
Matamoros	--	--	0	0	26	11.9	29	13.0	0[A]	0	0	0	32	13.4
Reynosa	--	--	1	0.6	15	8.0	0	0	1	0.5	1	0.5	21	9.9
Nuevo Laredo	--	--	9	5.1	2	1.1	104	55.4	49	25.4	22	11.1	41	20.2
Piedras Negras	--	--	3	4.7	13	19.4	352	501.3	50	68.0	47	61.1	34	42.3
Acuña	--	--	4	10.7	0	0	234	598.3	5[B]	12.5	1	2.4	0	0
Juarez	--	--	31	6.3	42	8.5	1,151	219.5	37	6.9	21	3.8	25	4.4
Agua Prieta	--	--	0	0	0	0	75[A]	241.6	0[C]	0	1	3.0	3	8.7
Nogales	--	--	0	0	0	0	23	36.1	2[D]	3.1	1	1.5	0	0
San Luís Río Col.	--	--	0	0	4	4.9	26	30.9	5[D]	5.8	2	2.2	2	2.2
Mexicali	--	--	--	--	1	0.2	681	143.0	66	13.5	31	6.2	18	3.5
Tijuana	--	--	2	0.5	7	1.7	170	40.0	23	5.3	15	3.3	12	2.6
Total 11 Municipios	--	--	--	--	110	4.9	2,845	122.8	238	10.0	142	5.8	188	7.5
Mexico	--	101.7	--	2.6	--	39.5	--	38.8	--	4.8	--	15.7	--	44.1

TABLE 5.1 (Cont.)

Sources: California Department of Health Services, Communicable Diseases, 1975-77.
California Department of Public Health, Communicable Diseases, 1970.
Centers for Disease Control, Morbidity and Mortality Weekly Report.
Pan American Health Organization, U.S.-Mexico Border Field Office, Border Epidemiological Bulletin.
Servicios Coordinados de Salud Pública en Tamaulipas.
Secretaría de Salubridad y Asistencia, Epidemiología, 1 de abril, 1981.
Secretaría de Salubridad y Asistencia, Salud Pública de México.
Servicios Coordinados de Salud Pública en los Estados, Unidad de Informacíon, unpublished data.
Texas Department of Health, Reported Morbidity & Mortality in Texas, 1980.
Texas Department of Health, Texas Morbidity This Week.
U.S. Department of Health and Human Services, Health, United States, 1980.

Various information from the Arizona Department of Health Services, the Imperial County Health Department, the New Mexico Department of Health and Environment, the San Diego County Health Department, and Texas Department of Health.

Notes:
A = 51 weeks only
B = 43 weeks only
C = 50 weeks only
D = 48 weeks only

TABLE 5.2

REPORTED RUBELLA (RUBEOLA-SP.) CASES AND RATE PER 100,000 PERSONS, U.S. BORDER COUNTIES AND MEXICO BORDER STATES

	1970		1975		1976		1977	
County	#	Rate	#	Rate	#	Rate	#	Rate
Cameron	73	52.0	7	4.0	3	1.6	8	4.2
Hidalgo	182	100.3	1	0.4	5	2.1	4	1.6
Webb	218	299.2	6	7.0	0	0	1	1.1
Maverick	4	22.1	4	16.2	0	0	0	0
Val Verde	16	58.2	0	0	0	0	3	9.0
El Paso	0	0	0	0	3	0.7	2	0.5
Cochise	--	--	--	--	--	--	0	0
Santa Cruz	--	--	--	--	--	--	0	0
Pima	--	--	--	--	--	--	1	0.2
Yuma	--	--	--	--	--	--	0	0
Imperial	56	75.2	23	27.6	18	21.2	35	40.3
San Diego	177	13.0	58	3.6	58	3.5	262	15.3
Estados								
Tamaulipas	210	14.2	121	7.1	170	9.7	689	38.5
Nuevo León	167	9.7	104	5.0	132	6.1	145	6.5
Coahuila 7	0.6	774	57.7	590	42.6	569	39.9	
Chihuahua	155	9.5	183	10.3	374	20.6	472	25.6
Sonora 18	1.6	32	2.5	34	2.5	236	17.1	
Baja Cal. Nte.	64	7.2	26	2.5	20	1.8	143	12.7
Mexico --	7.0	--	5.6	--	7.5	--	9.2	

TABLE 5.2 (Cont.)

	1978		1979		1980	
County	#	Rate	#	Rate	#	Rate
Cameron	12	6.1	2	1.0	3	1.4
Hidalgo	4	1.5	6	2.2	10	3.5
Webb	0	0	6	6.2	2	2.0
Maverick	0	0	0	0	0	0
Val Verde	0	0	0	0	0	0
El Paso	0	0	4	0.9	8	1.7
Cochise	0	0	1	1.2	1	1.2
Santa Cruz	0	0	1	5.0	1	4.9
Pima	12	2.4	23	4.5	5	0.9
Yuma	1	1.2	2	2.3	0	0
Imperial	25	28.2	19	21.0	5	5.4
San Diego	--	--	--	--	--	--
U.S.A.	--	8.4	--	5.4		
Estados						
Tamaulipas	36	2.0	632	33.6	--	--
Nuevo León	154	6.7	--	--	--	--
Coahuila	412	28.0	1,540	101.7	--	--
Chihuahua	273	14.6	431	22.6	--	--
Sonora	198	13.9	437	29.9	--	--
Baja Cal. Nte.	113	9.8	368	30.9	--	--
Mexico	--	7.1	--	--	--	--

TABLE 5.2 (Cont.)

Sources: California Department of Public Health, Communicable Diseases, 1970.
California Department of Health Services, Communicable Diseases, 1975-1977.
Centers for Disease Control, Morbidity and Mortality Weekly Report.
Secretaria de Salubridad y Asistencia, Salud Pública de México.
Servicios Coordinados de Salud Pública en los Estados, Unidad de Informacíon, unpublished data.
Texas Department of Health, Reported Morbidity and Mortality in Texas, 1980.
Texas State Health Coordinating Council, The Texas State Health Plan, 1980.

Various information from the Arizona Department of Health Services, the Imperial County Health Department, the New Mexico Department of Health and Environment, and the Texas Department of Health, Communicable Diseases Division.

TABLE 5.3

REPORTED PERTUSSIS (TOS FERINA) CASES AND RATE PER 100,000 PERSONS

	1970		1975		1976		1977		1978		1979		1980	
County	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate
Cameron	7	5.0	0	0	0	0	2	1.1	1	.5	0	0	0	0
Hidalgo	7	3.9	0	0	0	0	0	0	1	.4	0	0	0	0
Webb	27	37.1	0	0	0	0	0	0	0	0	1	1	0	0
Maverick	4	22.1	0	0	0	0	0	0	0	0	0	0	0	0
Val Verde	0	0	0	0	0	0	2	6.0	0	0	0	0	0	0
El Paso	1	0.3	0	0	0	0	1	0.2	0	0	3	0.6	2	0.4
Imperial	6	8.1	3	3.6	0	0	0	0	--	--	--	--	--	--
San Diego	31	2.3	4	0.2	7	0.4	8	0.5	11	0.6	5	0.3	22	1.2
U.S.A.	--	2.1	--	0.8	--	0.5	--	1.0	--	0.9	--	0.7	--	0.8
Estados														
Tamaulipas	657	44.5	59	3.5	43	2.5	47	2.6	8	0.4	59	3.1	121	6.3
Nuevo León	401	23.4	37	1.8	173	8.0	139	6.2	12	0.5	--	--	64	2.6
Coahuila	1,212	107.3	44	3.3	32	2.3	109	7.6	62	4.2	163	10.8	64	4.1
Chihuahua	601	36.8	65	3.6	81	4.5	150	8.1	34	1.8	88	4.6	42	2.2
Sonora	360	32.4	140	10.7	52	3.9	93	6.7	95	6.7	224	15.3	284	18.9
Baja Cal. Nte.	417	47.3	21	2.0	32	2.9	18	1.6	47	4.1	32	2.7	29	2.4
Mexico	--	25.4	--	5.9	--	7.6	--	12.1	--	4.9	--	--	--	8.2

Sources: California Department of Public Health, Communicable Diseases, 1970.
California Department of Health Services, Communicable Diseases, 1975-1977.
Centers for Disease Control, Morbidity and Mortality Weekly Report.
Secretaría de Salubridad y Asistencia, Epidemiología, 1 de abril, 1981.
Secretaría de Salubridad y Assistencia, Salud Pública de México.
Servicios Coordinados de Salud Pública en los Estados, Unidad de Informacíon, unpublished data.
Texas Department of Health, Reported Morbidity and Mortality in Texas, 1980.
Texas Department of Health, Texas Morbidity This Week.
U.S. Department of Health and Human Services, Health, United States, 1980.

Various information from the San Diego County Health Department and the Texas Department of Health, Communicable Diseases Division.

TABLE 5.4

REPORTED POLIO CASES AND RATE PER 100,000 PERSONS

	1970		1975		1976		1977		1978		1979		1980	
County	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate
Cameron	3	2.1	0	0	0	0	0	0	0	0	0	0	0	0
Hidalgo	7	3.9	0	0	0	0	1	0.4	0	0	0	0	0	0
Webb	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maverick	1	5.5	0	0	0	0	1	3.6	0	0	0	0	0	0
Val Verde	0	0	0	0	0	0	0	0	0	0	0	0	0	0
El Paso	1	0.3	1	0.2	0	0	0	0	0	0	0	0	0	0
Cochise	--	--	--	--	0	0	0	0	0	0	--	--	--	--
Santa Cruz	--	--	--	--	0	0	0	0	0	0	--	--	--	--
Pima	--	--	--	--	0	0	1	0.2	1	0.2	--	--	--	--
Yuma	--	--	--	--	0	0	0	0	0	0	--	--	--	--
Imperial	0	0	0	0	0	0	0	0	0	0	0	0	0	0
San Diego	1	0.1	1	0	0	0	0	0	0	0	0	0	0	0
U.S.A.	--	<0.1	8	<0.1	12	<0.1	17	<0.1	9	<0.1	26	<0.1	8	<0.1

TABLE 5.4 (Cont.)

Municipios	1970 #	1970 Rate	1975 #	1975 Rate	1976 #	1976 Rate	1977 #	1977 Rate	1978 #	1978 Rate	1979 #	1979 Rate	1980 #	1980 Rate
Matamoros	--	--	2	0.9	1	0.5	4	1.8	2[A]	0.9	0	0		
Reynosa	--	--	3	1.7	0	0	1	0.5	0	0	0	0		
Nuevo Laredo	--	--	5	2.8	0	0	0	0	0	0	0	0		
Piedras Negras	--	--	0	0	0	0	0	0	3	4.1	0	0		
Acuña	--	--	1	2.7	0	0	0	0	0[B]	0	0	0		
Juarez	--	--	2	0.4	1	0.2	3	0.6	4	0.7	1	0.2		
Agua Prieta	--	--	0	0	1	3.3	1[A]	3.2	0[C]	0	0	0		
Nogales	--	--	0	0	1	1.6	0	0	1[D]	1.5	0	0		
San Luís Río Col.	--	--	0	0	0	0	0	0	0[D]	0	0	0		
Mexicali	--	--	2	0.4	0	0	0	0	5	1.0	0	0		
Tijuana	--	--	1	0.2	0	0	4	0.9	10	2.3	2	0.4		
Total 11 Municipios	--	--	16	0.7	4	0.2	13	0.6	25	1.0	3	0.1		
Mexico	--	3.4	--	1.6	--	0.5	--	1.5	--	1.1	--	--		

TABLE 5.4 (Cont.)

Sources: California Department of Health Services, Communicable Diseases, 1970.
California Department of Public Health, Communicable Diseases, 1975-1977.
Centers for Disease Control, Morbidity and Mortality Weekly Report.
Pan American Health Organization, U.S.-Mexico Border Field Office, Border Epidemiological Bulletin.
Servicios Coordinados de Salud Pública en el Estado de Tamaulipas, unpublished data.
Secretaria de Salubridad y Assistencia, Epidemiológia, 1 de abril, 1981.
Secretaria de Salubridad y Assistencia, Salud Pública de México.
Servicios Coordinados de Salud Pública en los Estados, Unidad de Informacíon, unpublished data.
Texas Department of Health, Texas Morbidity This Week.
U.S. Department of Health and Human Services, Health, United States, 1980.

Various information from the Arizona Department of Health Services, the Imperial County Health Department, and the San Diego County Health Department.

Note:
A = 51 weeks only
B = 43 weeks only
C = 50 weeks only
D = 48 weeks only

TABLE 5.5

REPORTED AMEBIASIS, SALMONELLOSIS AND SHIGELLOSIS COMBINED CASES AND RATE PER 100,000 PERSONS

	1970		1975		1976		1977		1978		1979		1980	
County	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate
Cameron	62	44.1	11	6.3	5	2.7	8	4.2	18	9.2	55	27.2	139	66.3
Hidalgo	1	0.6	52	22.4	30	12.4	33	13.1	20	7.6	126	46.2	207	73.1
Webb	2	2.8	1	1.2	1	1.1	5	5.5	17	18.1	116	120.1	103	103.8
Maverick	0	0	1	4.0	0	0	0	0	0	0	2	6.6	1	3.2
Val Verde	0	0	3	9.5	0	0	0	0	6	17.5	4	11.5	8	22.3
El Paso	30	8.3	18	3.4	126	29.1	208	46.8	171	37.5	326	69.8	241	50.2
Cochise	--	--	--	--	6	7.9	15	19.2	16	19.8	19	22.8	17	19.9
Santa Cruz	--	--	--	--	3	16.8	4	21.6	8	41.8	5	25.2	14	68.4
Pima	--	--	--	--	355	77.2	297	62.2	268	54.1	186	36.2	206	38.8
Yuma	--	--	--	--	7	8.9	6	7.3	16	18.9	12	13.7	20	22.1
Imperial	12	16.1	29	34.8	26	30.5	27	31.2	61	68.9	51	56.4	67	72.7
San Diego	189	14.0	392	24.3	466	28.0	582	34.0	523	29.7	676	37.4	475	25.5
Total 12 Counties	--	--	--	--	1,025	30.5	1,185	33.9	1,124	31.2	1,578	42.5	1,498	39.3
U.S.A.	--	19.0	--	19.7	--	18.2	--	21.7	--	24.2	--	26.1	--	25.7

TABLE 5.5 (Cont.)

Estados	1970 Rate	1975 Rate	1976 Rate	1977 Rate	1978 Rate
Tamaulipas	--	69.3	63.8	88.0	99.2
Nuevo León	--	808.6	605.3	727.7	635.6
Coahuila	--	1144.9	1193.1	1166.6	1445.5
Chihuahua	--	280.5	392.4	434.4	477.6
Sonora	--	168.3	175.1	227.7	215.9
Baja Cal. Norte	--	39.0	36.8	56.4	42.7
Total Mexico	68.8	177.1	194.1	239.3	267.9

Sources: California Department of Public Health, Communicable Diseases, 1970.
California Department of Health Services, Communicable Diseases, 1975-1977.
Centers for Disease Control, Morbidity and Mortality Weekly Report.
Secretaria de Salubridad y Asistencia, Salud Pública de México.
Servicios Coordinados de Salud Pública en los Estados, Unidad de Información, unpublished data.
Texas Department of Health, Communicable Disease Division.
Texas Department of Health, Reported Morbidity and Mortality in Texas, 1980.
Texas Department of Health, Texas Morbidity This Week.
U.S. Department of Health and Human Services, Health, United States, 1980.
Vargas Perez, Dra. María Angélica et al, Situación de Salud en la Frontera Mexico/Estados Unidos y Algunas Alternativas de Solución, 1978.

Various information from the Arizona Department of Health Services, the Imperial County Health Department, the New Mexico Health and Environment Department, and the San Diego County Health Department.

TABLE 5.6

REPORTED INFECTIOUS HEPATITIS CASES AND RATE PER 100,000 PERSONS

	1970		1975		1976		1977		1978		1979		1980	
County	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate
Cameron	77[A]	54.9	44	25.1	64	35.2	17	9.0	73	37.3	78	38.5	15	7.2
Hidalgo	52[A]	28.6	38	16.4	44	18.1	22	8.7	15	5.7	21	7.7	7	.5
Webb	93[A]	127.6	13	15.1	7	7.9	3	3.3	0	0	16	16.6	34	34.3
Maverick	4[A]	22.1	4	16.2	15	57.5	0	0	5	17.4	2	6.7	0	0
Val Verde	4[A]	14.6	11	34.7	1	3.1	7	21.0	0	0	7	20.0	1	.3
El Paso	38[A]	10.6	113	26.9	102	23.6	152	34.3	153	33.6	126	26.9	180	37.5
Cochise	--	--	31	42.0	35	45.9	22	28.0	19	23.5	10	12.0	5	5.8
Santa Cruz	--	--	0	0	6	33.6	3	16.2	5	26.1	3	15.1	15	73.3
Pima	--	--	106	24.0	125	27.2	408	85.4	108	21.8	88	17.1	57	10.7
Yuma	--	--	12	15.9	7	8.9	3	3.7	10	11.8	8	9.1	8	7.7
Imperial	39		52.3	21	25.2	42	39	44.9	41	45.2	42	46.5	28	30.4
San Diego	508	37.4	279	17.3	354	21.3	302	17.7	122	6.9	127	7.0	563	30.2
Total 12 Counties	--	--	672	20.5	802	23.7	978	28.0	551	15.3	528	14.2	913	23.9
U.S.A.	--	27.9	--	16.8	--	15.5	--	14.4	--	13.5	--	13.8	--	12.8

TABLE 5.6 (Cont.)

	1970		1975		1976		1977		1978		1979		1980	
Municipio[A]	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate
Matamoros	--	--	8	3.7	2	0.9	4	1.8	7[B]	3.1	3	1.3	7	2.9
Reynosa	--	--	4	2.2	4	2.3	1	0.5	0	0	2	1.0	1	0.5
Nuevo Laredo	--	--	2	1.1	1	0.5	24	12.8	24	12.4	49	24.7	45	22.1
Piedras Negras	--	--	18	28.3	45	67.3	51	72.6	125	169.9	67	87.1	159	198.0
Acuña	--	--	8	21.0	1	2.6	0	0	0	0	0	0	1	2.4
Juarez	--	--	140	28.2	105	20.6	455	86.8	410	76.1	51	9.2	127	22.4
Agua Prieta	--	--	17	59.0	6	20.0	19	61.2	4[C]	12.4	2	6.0	3	8.7
Nogales	--	--	1	1.6	4	6.4	7	11.0	11[D]	16.9	2	3.0	1	1.5
San Luís Río Col.	--	--	1	1.3	3	3.7	0	0	4[D]	4.6	2	2.2	4	4.3
Mexicali	--	--	--	--	1	0.2	11	2.3	57	11.7	32	6.4	53	10.4
Tijuana	--	--	5	0.1	4	1.0	15	3.5	38	8.7	12	2.7	28	6.1
Total 11 Municipios	--	--	--	--	176	7.8	587	25.3	680	28.6	222	9.1	429	17.1
Mexico	--	7.0	--	7.5	--	5.3	--	8.3	--	6.4	--	--	--	29.5

TABLE 5.6 (Cont.)

Sources: California Department of Public Health, Communicable Diseases, 1970.
California Department of Health Services, Communicable Diseases, 1975-1977.
Centers for Disease Control, Morbidity and Mortality Weekly Report.
Pan American Health Organization, U.S.-Mexico Border Field Office, Border Epidemiological Bulletin.
Secretaria de Salubridad y Asistencia, Epidemiología, 1 de abril, 1981.
Secretaria de Salubridad y Asistencia, Salud Pública de México.
Servicios Coordinados de Salud Pública in el Estado de Tamaulipas, unpublished data.
Servicios Coordinados de Salud Pública en los Estados, Unidad de Informacíon, unpublished data.
Texas Department of Health, Reported Morbidity and Mortality in Texas, 1980.
Texas Department of Health, Texas Morbidity This Week.
Vargas Perez, Dra. María Angélica et al., Situacíon de Salud.
en la Frontera México/Estados Unidos y Algunas Alternativas de Solución, 1978.

Various information from the Arizona Department of Health Services, the Imperial County Health Department, the New Mexico Health and Environment Department, and the San Diego County Health Department.

Notes:
A. All Types of Hepatitis.
B. 51 weeks only.
C. 50 weeks only.
D. 48 weeks only.

TABLE 5.7

REPORTED NEW ACTIVE CASES OF TUBERCULOSIS RATE PER 100,000 PERSONS

County	1970[A] #	1970[A] Rate	1975[A] #	1975[A] Rate	1976 #	1976 Rate	1977 #	1977 Rate	1978 #	1978 Rate	1979 #	1979 Rate	1980 #	1980 Rate
Cameron	98	69.8	124	70.8	85	46.7	73	38.6	75	38.3	62	30.6	46	21.9
Hidalgo	91	50.1	99	42.6	76	31.3	69	27.3	72	27.4	71	26.0	85	30.0
Webb	36	49.4	36	41.8	44	49.6	40	43.8	40	42.6	38	39.3	45	45.3
Maverick	9	49.7	24	97.0	16	61.3	20	73.0	16	55.7	18	59.9	20	63.7
Val Verde	20	72.8	20	63.1	17	52.3	13	38.9	8	23.4	9	25.7	0	0
El Paso	219	61.0	112	26.7	75	17.4	113	25.5	83	18.2	78	16.7	98	20.4
Cochise	--	--	10	13.5	6	7.9	7	8.9	12	14.8	8	9.6	10	11.7
Santa Cruz	--	--	3	17.4	3	16.8	4	21.6	2	10.4	2	10.1	10	48.9
Pima	--	--	77	17.4	80	17.4	58	12.1	80	16.1	62	12.1	101	19.0
Yuma	--	--	--	--	13	16.5	14	17.1	26	30.7	30	34.3	45	49.7
Imperial	35	47.0	39	46.8	37	43.5	30	34.6	38	42.9	29	32.1	31	33.7
San Diego	191	14.1	240	14.9	258	15.5	261	15.3	253	14.4	242	13.4	327	17.6
Total 12 Counties	--	--	--	--	710	21.0	702	20.1	705	19.6	649	17.5	818	21.4
U.S.A.	--	18.2[C]	--	15.9[C]	--	15.0	--	13.9	--	13.1	--	12.6	--	12.3
Estados[B]														
Tamaulipas	--	47.1	--	27.0	--	20.6	--	18.3	--	14.3	--	--	--	--
Nuevo León	--	122.5	--	28.3	--	14.3	--	13.3	--	12.1	--	--	--	--
Coahuila	--	49.8	--	75.1	--	48.7	--	53.4	--	37.9	--	--	--	--
Chihuahua	--	59.6	--	61.6	--	57.7	--	46.5	--	32.9	--	---	--	--
Sonora	--	44.8	--	15.6	--	27.4	--	31.2	--	22.0	--	36.9	--	41.0
Baja California Norte	--	95.2	--	20.5	--	16.3	--	17.2	--	26.4	--	--	--	--
Mexico[B]	--	32.0	--	18.5	--	18.3	--	16.5	--	15.1	--	--	--	--

TABLE 5.7 (Cont.)

Sources: California Department of Public Health, Communicable Diseases, 1970.
California Department of Health Services, Communicable Diseases, 1975-1977.
Centers for Disease Control, Morbidity and Mortality Weekly Report.
Pan American Health Organization, U.S.-Mexico Border Field Office, Border Epidemiological Bulletin.
Secretaria de Salubridad y Asistencia, Salud Pública de México.
Servicios Coordinados de Salud Pública en los Estados, Unidad de Informacíon, unpublished data.
Texas Department of Health, Reported Morbidity and Mortality in Texas, 1980.
Texas Department of Health, Texas Morbidity This Week.
Texas State Health Coordinating Council, The Texas State Health Plan, 1982.
U.S. Department of Health and Human Services, Health, United States, 1980.

Various information from the Arizona Department of Health Services, the Imperial County Health Department, the New Mexico Health and Environment Department, and the San Diego County Health Department.

Notes: A. 1970 and 1975 measures are not comparable.
B. Pulmonary cases only.

TABLE 5.8

REPORTED TYPHOID CASES AND RATE PER 100,000 PERSONS

	1970		1975		1976		1977		1978		1979		1980	
County	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate
Cameron	1	0.7	0	0	0	0	0	0	1	0.5	0	0	0	0
Hidalgo	0	0	0	0	1	0.4	0	0	2	0.8	1	0.4	2	0.7
Webb	0	0	2	2.3	2	2.3	0	0	0	0	11	11.4	8	8.1
Maverick	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Val Verde	0	0	0	0	0	0	0	0	0	0	0	0	0	0
El Paso	0	0	0	0	0	0	7	1.6	9	2.0	11	2.4	5	1.0
Cochise	--	--	0	0	0	0	2	2.5	0	0	0	0	0	0
Santa Cruz	--	--	0	0	0	0	5	27.5	0	0	1	5.0	1	4.9
Pima	--	--	1	0.2	2	0.4	1	0.2	2	0.4	0	0	0	0
Yuma	--	--	0	0	0	0	2	2.4	1	1.2	0	0	0	0
Imperial	0	0	1	1.3	1	1.2	0	0	0	0	0	0	2	2.2
San Diego	1	0.1	8	0.5	6	0.4	7	0.4	8	0.5	10	0.6	5	0.3
Total 12 Counties	--	--	12	0.4	12	0.4	24	0.7	23	0.6	34	0.9	23	0.6
U.S.	--	0.2	--	0.2	--	0.2	--	0.2	--	0.2	--	0.2	--	0.2

TABLE 5.8 (Cont.)

	1970		1975		1976		1977		1978		1979		1980	
Municipio	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate
Matamoros	--	--	0	0	0	0	0	0	1[A]	0.4	0	0	32	13.4
Reynosa	--	--	1	0.6	0	0	0	0	3	1.5	3	1.5	21	9.9
Nuevo Laredo	--	--	10	5.6	0	0	38	20.2	82	42.5	45	22.7	67	33.0
Piedras Negras	--	--	12	18.9	2	3.0	61	86.9	99	134.6	48	62.4	79	98.4
Acuña	--	--	2	5.4	0	0	0	0	3[B]	7.5	0	0	0	0
Juarez	--	--	16	3.2	12	2.4	9	1.7	13	2.4	9	1.6	11	1.9
Agua Prieta	--	--	0	0	0	0	3	9.7	0[C]	0	0	0	1	2.9
Nogales	--	--	0	0	0	0	0	0	0[D]	0	2	3.0	1	1.5
San Luís Río Col.	--	--	0	0	9	11.1	2	2.4	0[D]	0	0	0	2	2.2
Mexicali	--	--	0	0	0	0	13	2.7	26	5.3	13	2.6	39	7.6
Tijuana	--	--	3	0.7	1	0.2	3	0.7	5	1.1	6	1.3	13	2.8
Total 12 Municipios	--	--	--	--	24	1.1	129	5.6	232	9.7	126	5.1	266	10.6
Mexico	--	5.7	--	3.6	--	4.0	--	4.7	--	4.3	--	--	--	--

TABLE 5.8 (Cont.)

Sources: California Department of Public Health, Communicable Diseases, 1970.
California Department of Health Services, Communicable Diseases, 1975-1977.
Pan American Health Organization, U.S.-Mexico Border Field Office, Border Epidemiological Bulletin.
Secretaría de Salubridad y Asistencia, Epidemiología, 1 de abril, 1981.
Secretaría de Salubridad y Asistencia, Salud Pública de México.
Servicios Coordinados de Salud Pública en los Estados, Unidad de Informacíon, unpublished data.
Texas Department of Health, Reported Morbidity and Mortality in Texas, 1980.
Texas Department of Health, Texas Morbidity This Week.

Various information from the Arizona Department of Health Services, the Imperial County Health Department, the New Mexico Health and Environment Department, the San Diego County Health Department, and the Texas Department of Health, Communicable Disease Division.

Notes: A = 51 weeks only
B = 43 weeks only
C = 50 weeks only
D = 48 weeks only

CHAPTER 6

HEALTH CARE RESOURCES AND UTILIZATION ON THE UNITED STATES SOUTHERN BORDER

In this chapter we discuss trends in the availability and utilization of maternal and child health care resources on the United States side of the border. We progress from discussing hospital beds and personnel and their utilization to specific programs such as family planning, prenatal care, and obstetrical and pediatric care. It should be understood that utilization of private practitioners is not generally captured in government reports or accounts of government programs. Also, we have little information on private insurance coverage and private ambulatory utilization, although hospital utilization data are available. Despite gaps in much of the data, a general picture of the health care situation does emerge.

6.1 Hospitals and Hospital Use

The number of hospital beds increased in most of the principal border counties from 1975 to 1980. In the Lower Rio Grande Valley Region, hospital beds increased from 549 in 1972 to 1,256 in 1981 (table 6.1), with several hundred additional beds approved or under construction. In the Mid-Rio Grande Region, the total beds stayed at 475 from 1975 through 1981, although another 50 to 100 beds are under construction in Laredo. In the El Paso region, the number of beds was relatively stable, increasing from 2,216 in 1975 to 2,471 in 1981. For the eastern Arizona border counties (Region 4), the increase was from 2,785 in 1975 to 2,882 in 1980 (table 6.2). The change in Region 5 (Yuma and Imperial counties) was from 297 beds in 1975 to 277 in 1980. Finally, for the same years the total number of hospital beds in San Diego decreased from 7,728 to 7,408.

The information on the Texas counties is from the data maintained and checked by the Texas Department of Health and includes estimates for hospitals even if they don't submit their annual questionnaires. The California and Arizona data is from the annual hospital guide issue published by the American Hospital Association. It is dependent on voluntary submission of data and may not be entirely accurate.

More recent information on Imperial and San Diego counties shows an increase of general acute care beds in Imperial County from 206 in 1983 to 216 in 1985 and, in San Diego County, from 5,383 to 5,705 (table 6.3). In Imperial County, 136 of the beds in 1985 were medical/surgical beds, 24 were pediatric, 32 were perinatal, and 4 were newborn ICU beds. San Diego County in 1983 had 3,916 medical/surgical beds, 326 pediatric, 373 perinatal and 78 newborn beds.

Hospital expenditures, as reported in the American Hospital Association guide (tables 6.1 and 6.2), increased much more rapidly than beds or utilization. In each area hospital expenditures approximately doubled between 1975 and 1980. Total expenditures for the six regions increased from $451.4 million in 1975 (using 1972 data for the Lower Rio Grande Valley) to $809.3

million in 1980 (not including Maverick County). However, when inflation is taken in account, the increase in real expenditures has not been substantially greater than the increase in either beds or utilization, and none of these have clearly outstripped the increase in population on the border.

Utilization data over time are available for the Texas counties. Here the increase is greater than the increase in beds. In the Lower Rio Grande Valley, patient days increased from 270,257 in 1975 to 321,192 in 1981. In the Mid Rio Grande Valley, the increase was from 117,232 to 144,451, while in El Paso patient days increased from 408,929 to 471,222. In California, we have a glimpse of utilization in the year 1983 (table 6.3). The 54,129 patient days in Imperial County in general acute care hospital beds resulted from a 72% occupancy rate. San Diego, with 1.26 million patient days, had 64.3% occupancy. In both counties, occupancy was higher for medical/surgical beds and occupancy of pediatric, perinatal, and newborn beds were lower, except for San Diego's newborn beds, which had 94% occupancy.

In the Texas counties for years that data are available, obstetrical and pediatric admissions increased steadily from 1975 through 1981 (table 6.1). In the case of obstetrics, admissions rose by 41.1% in the Lower Rio Grande Region, by 35.2% in the Mid-Rio Grande Region, and by 35.9% in El Paso. The total number of obstetric admissions in the six principal Texas border counties rose 37.6% from 22,208 in 1975 to 30,575 in 1981. On the other hand, total obstetric patient days in the six counties rose by only 8.9% from 85,400 in 1975 to 93,012 in 1981. The average length of stay for obstetrics in these six counties was 3.8 days in 1975 and dropped to 3.04 in 1981. This substantial reduction in the average length of stay for obstetrics means that even though total obstetrical admissions in the key Texas border counties increased markedly, the number of obstetrical patient days increased only moderately.

For pediatric hospital use, the story in the Texas border counties is very similar. Pediatric admissions increased between 1975 and 1981 by 75.5% in the Lower Rio Grande, by 34.1% in the Mid Rio Grande, and by 227% in the El Paso region. Total pediatric admissions increased for the six key Texas border counties under consideration from 10,837 in 1975 to 23,699 in 1981 or by 119%. During the same period, pediatric patient days in these six counties increased from 61,253 to 78,433--an increase of only 28%. Average length of stay for pediatric patients in 1975 was 5.65 days, but by 1981 it had fallen to 3.31 days.

Table 6.4 presents information on patient's county of origin for the 10,586 hospital admissions in four sample weeks of 1979-80 to hospitals located in the six Texas border counties.[1] Of the total, 85% of the admissions were residents of the county in which the facility was located. Another 4% were residents of any of the other 15 counties located on or near the border. About 2% were residents of other areas of Texas, 7% from other states, and 2% from Mexico. The reader should recognize that immigration policy and policies of local hospitals may discourage declaration of Mexican residence.

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[1] The data in this section are from Ann E. Henry, *Texas-Mexico Border Area Migration for Acute Care Hospital Admission*, Working Paper No. 22 (Austin: Lyndon B. Johnson School of Public Affairs, Austin, 1983).

While each of the six principal Texas counties draw most of their patients from the same county, Cameron and Hidalgo counties depend on some in-migration from other border counties as well as in-migration from each other. Specifically, Cameron County tends to obtain patients from Willacy County to the north, and Hidalgo County from Starr County to the west. El Paso County draws a number of patients from New Mexico.

Table 6.5 shows places of hospitalization for residents of the six principal Texas border counties. Of the total 9,967 sample admissions, 90% were admitted to facilities in their home counties. Less than 10% migrated to other Texas locations, most often Bexar County (San Antonio). Border residents who were hospitalized in Mexican or New Mexico hospitals are not included in this data, which only includes persons hospitalized in Texas hospitals.

While 98% of El Paso County resident hospitalizations were patients who stayed in the county, the remaining counties retained less than 87% of their residents needing hospital care. Maverick County facilities met less than 75% of their residents' hospital needs, and the Val Verde facility only handled 42% of Val Verde resident admissions. Cameron and Hidalgo Counties' residents who went elsewhere for hospital care tended to go to other border counties, to Bexar County (City of San Antonio), and to a lesser extent Harris (Houston), Nueces (Corpus Christi) or Galveston counties. Webb, Maverick, and Val Verde residents relied much more on Bexar County, especially residents of Maverick and Val Verde counties.

Of the total 9,967 sample admissions of residents from the six border counties, 16% were women ages 15-44 who were admitted to obstetrics units, and 12% were children admitted to pediatrics (table 6.6). Of the total admissions, one-third were women ages 15-44 and 13.5% were children ages 1-14. While the respective counties differed somewhat with respect to these patterns, it is not clear whether these differences result from random fluctuations, from demographic differences across counties, or from differing health care needs of the respective populations.

Table 6.7 compares residents of Mexico with residents of the six Texas border counties who were admitted to any Texas hospital. Among the county residents, 33.4% of admissions were women ages 15-44 regardless of medical service. About half of these were obstetrical admissions. Mexican women ages 15-44 comprised 38.7% of the total Mexican origin admissions and 19.7% of the Mexican origin admissions were obstretical. However, the figures reverse for children ages 1-14 and for pediatric services. Mexican residents admitted to Texas hospitals were less likely to be children or to need pediatric services than were residents of the six border counties.

Of the obstetrical admissions of women ages 15-44 from the six counties, 99% were hospitalized somewhere along the border. Such was the case for 93% of similar admissions of Mexico residents to Texas hospitals. For other types of admissions, the border area accounted for 91% of admissions of residents of the six counties. However, less than half of the non-obstetric patients from Mexico hospitalized in Texas stayed in border facilities. Thus, while Mexican residents hospitalized in Texas are more likely to travel to interior Texas facilities than residents of the border counties, the obstetrical patients from

Mexico almost always stay on the border.

6.2 Utilization of Different Providers and Institutions for Births

There have been changes in patterns of utilization of providers of obstetric care over the past decade. In the Texas counties, non-physician birth attendants increased as a percentage of births by residence, by occurrence, and by residents giving birth in their county of residence between 1970 and 1980. The development of a birthing clinic at Su Clinica Familiar in Harlingen where certified nurse midwives attend the births, the employment of a certified nurse at R. E. Thomason General Hospital in El Paso, and increased numbers of Anglo middle-class nurse midwives in El Paso account for more than the increase in the proportion of non-physician attended births. In other words, the proportion of partera and physician attended births both declined in Texas during the decade of the seventies.

Table 6.10 shows that in 1980, more than 6,500 of the 33,300 births which occurred in the six principal Texas border counties were attended by non-physicians. Of these, fewer than 3,700 of the 26,800 births occurring in the six counties among residents of those counties were non-physician attended. This indicates that more than 2,800 of the non-physician attended births occurring in the counties were births to women residing elsewhere. Most of the in-migrants for non-physician attended births were women from Mexico. For the Arizona counties, there was a significant increase in the number of midwife births in Pima County between 1970 and 1980; but even so, physician attended births were still roughly 94% of the total.

Table 6.8 presents the components of migration for births in and out of the respective principal border counties of Texas and Arizona. Births to residents of the counties increased from 32,463 to 40,101 from 1970 to 1980. The number of births to residents minus the number of residents who gave birth outside of their respective counties of residence (out-migrating births) plus the number of births occurring in the respective counties to residents of other places (in-migrating births) equals the number of births occurring in each county. Out-migration for births increased somewhat over the decade; in-migration for births appears to have decreased. The net in-migration for births decreased from 6,926 in 1970 to 6,235 in 1980.

Table 6.9 presents the ratio of in-migration to out-migration for birth. For the ten counties overall, in-migration exceeded out-migration for births by eight to one in 1970. In 1980, it was six to one. The respective counties differed in this aspect. The in-migration ratio increased in Cameron, Val Verde, El Paso, and Pima counties.

Overall, out-migration as a percentage of resident births was stable over the decade. The Cameron County out-migrating percentage decreased from 1970 to 1980. Out-migration for birth increased as a percentage of resident births in Cochise, Santa Cruz, and Yuma counties. In-migrating births as a percentage of births occurring in the counties decreased overall. In Cochise, Santa Cruz, and Pima counties it increased.

Table 6.10 presents birth attendants by migration for birth components for each of ten counties in 1970 and 1980. Among non-migrating resident births, use of lay midwives and "other" attendants was not uncommon in the Texas counties. El Paso and Pima counties had large increases in lay midwife attended births; Hidalgo had a small increase. Nurse-midwife attended births increased substantially in Cameron County. There was also some nurse midwife activity in 1980 in Pima and El Paso counties. The number of physician attended births increased in each county, except El Paso where there was a small decrease. In Santa Cruz the decrease in physician attended births by non-migrating residents was more than offset by the large increase in physician attended births to out-migrating residents.

The out-migrating births generally were attended by physicians. Occasional out-migration was for midwife attendance, most often from Hidalgo County, where 37 residents gave birth elsewhere and were attended by lay midwives/others.

About one-third of the women who migrated into the respective counties used lay midwives or "other" birth attendants. Two-thirds of in-migrants were physician attended. In-migration for nurse midwife care was rare. In the Texas counties, 40% of in-migrating births were lay midwife attended. In Cameron County, 70% of the in-migrating births were attended by lay midwives. The number of in-migrating lay midwife births exceeded resident lay midwife births in Cameron, Webb, and Val Verde counties in 1980.

Similar patterns are found in Table 6.11 which presents the institution of birth by migration status for the six Texas counties. Hidalgo and El Paso counties each had a number of maternity home births. The latter two counties had some maternity home utilization by in-migrants.

Table 6.12 presents the destination of out-migrants for birth from the six Texas counties in 1980. Out-migration for hospital birth to adjacent counties was common as was hospital use in nonadjacent counties and out-of-state migration. Similar information is presented in table 6.13 for women in-migrating for birth to the six Texas counties in 1980. In-migration from adjacent counties accounted for 18% of in-migration for birth. The great majority took place in a hospital or were physician attended. Only 4% of in-migration was from non-adjacent counties. The remaining 78% of in-migrating births were from out-of-state and almost half of those were lay midwife attended out-of-hospital births. Lay midwife attended in-migrating births from out-of-state exceeded hospital births from out-of-state.

6.3 Physicians and Nurses

Although traditionally the border area has been seen as a region with a shortage of physicians, in fact San Diego, Tucson, and to an extent El Paso are well supplied with physicians (table 6.14). The Lower Rio Grande Valley, which traditionally has suffered a substantial shortage of physicians has begun to reverse this tendency, in part through the help of National Health Service Corps physicians employed at several federally funded clinics. Some of these physicians have then remained in private practice in the region after their tour of duty was completed. In the Mid-Rio Grande and the Yuma/Imperial Valley areas, there are still real problems with physician shortages.

6.4 Family Planning

Although great advances have been made on both sides of the border to control family size, there continue to be a number of unwanted pregnancies as well as people in need of family planning counseling and services. In particular, sexually active unmarried teenagers and women with more than four children who do not wish another pregnancy appear to be prime candidates for such services.

In 1979, the Centers for Disease Control surveyed 2,135 women of fertile age (15-44) in 51 U.S. counties on or near the border.[2] In Texas, the study area reached as far north as San Antonio. In fact, almost 30% of the respondents lived in the San Antonio or Corpus Christi metropolitan areas, and the survey results were weighted for proportionately smaller samples in SMSAs. Thus, the results of the survey are not necessarily applicable to the immediate border. However, the survey results are instructive.

The survey found that Mexican-American women were much more likely than Anglo women to be in need of and not employing contraceptives.[3] This was so holding age, parity, poverty, education, or employment constant.[4] Because of low income, low education, and the transitory nature of much of the population, family planning services become particularly important.

Among the respondents, researchers found that Mexican-American women had significantly higher mean numbers of children ever born for all but the youngest age group (table 6.15). Mexican-American women were more likely to report that their last live birth was unwanted. This was so even when the figures were standardized for the differing ages of the respondents. Contraceptive use was lower among Mexican-Americans, especially among older women.

Sixty-five percent of the married Mexican-American respondents ages

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[2] J.C. Smith, C.W. Warren, and J. Garcia-Nunez, The U.S.-Mexico Border: Contraceptive Use and Maternal Health Care in Perspective, 1979 (El Paso: U.S./Mexico Border Health Association, November 1983).

[3] The study defined a woman in need of family planning services as having all four of the following characteristics: (1) fecund; (2) sexually active; (3) not currently pregnant; (4) not desiring pregnancy.

[4] Susan E. Holck, et al., "The Need for Family Planning Services Among Mexican-American and Anglo Women: Result of a Survey Along the U.S.-Mexico Border," submitted for publication in Family Planning Perspectives, U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, Atlanta, Georgia, 1981.

15-44 reported current contraceptive practice (table 6.16). Another 25% were not practicing contraception for pregnancy or sterility related reasons. The remaining 10% had an unmet need for family planning services. Among the women ages 20-44 with 0-7 years education, the current need approached 16%.

Among the Mexican-American women ages 15-44 who practiced contraception, about 26% were sterile (male or female), 43% used pills or IUDs, just under 3% used injectables, 17% used condoms, diaphragms, or foam, and the remaining 12% used rhythm, withdrawal, or other methods of contraception. Among the older women, sterilization was more common. Among the adult women with 0-7 years education, 6% used injectables. Because a large share of the respondents lived away from the immediate border, and because injectables are available only in Mexico, their usage may be considerably higher in the immediate border communities.

In terms of sources of contraceptive methods, Anglo women were much more likely to obtain contraception from private physicians or clinics (table 6.17). For example, 84% of the Anglo users of birth control pills obtained them from private physicians or clinics compared to only 47% of the Mexican- American women. Another 33% of the Mexican-American women obtained them from Planned Parenthood or the health department, compared to only 2% of the Anglo women. About 10% of the Mexican-American women obtained their birth control pills from hospitals usually non-military in nature, compared to 13% of the Anglo women who normally used military hospitals. The remaining 10% of Mexican-American women who used birth control pills obtained them in Mexico. This suggests that, in the immediate border communities, a somewhat larger percentage obtain pills from pharmacies in Mexico, usually without medical prescription.

Table 6.18 shows the percentage of respondents (ever married ages 15-44) who were not using contraceptives and were found to be in need of family planning services. Almost 11% of the Mexican-American women were in need of and not using contraceptives compared to less than 4% of the Anglo women. The difference applies regardless of age group, poverty status, or level of education. Among the Mexican-American women, the largest unmet need was in the youngest (15-24) and oldest (35-44) age groups. However, unmet need in the middle age group (25-34) was still higher than for any Anglo age group.

The same observation applies in relation to poverty status. The lower income Mexican-American women had greater unmet need than the upper income Mexican-American women, who, in turn, had greater unmet need than Anglo women regardless of income status.

The picture among never-married women is somewhat different. Mexican-American women ages 15-19 were less likely to have unmet need for family planning services than Anglo women of the same age (table 6.19). However, this outcome results from less need (i.e., no sexual partner) rather than use of contraception. Of those Mexican-American teenagers who were in need of services, only about half used contraceptives.

When asked whether they would accept services from medical persons other than physicians, the Mexican-American non-users (of contraception) were somewhat more likely than Anglo women to say "no" (table 6.20). But the great majority of Mexican-American women (83%) said "yes" or "don't care." When asked whether they preferred family planning services from a male or a female, 46% of the Mexican-American women stated that they preferred service from a female, while only 10% preferred a male (the rest said it didn't matter). The Anglo women had less sexual preference for medical service providers. Two-thirds said it didn't matter, while the rest were evenly split in their attitudes toward male and female providers.

In the U.S. border counties, in addition to local resources, there are a number of providers of family planning services funded by several federal programs (table 6.21). The principal programs are Titles XIX (Medicaid) and XX of the Social Security Act and Title X, the Family Planning Program of the Public Health Service Act. Title X provides project grants for public or nonprofit agencies to offer medical and social services to people desiring family planning services, low income individuals in particular. Title XX funds family planning counseling activities, while Medicaid, (Title XIX) is mandated to cover family planning services for Medicaid enrollees. There are also some funds available through Titles IV and V of the Social Security Act.

In most counties along the U.S.-Mexico border there are multiple providers of family planning services, usually clinics maintained by both state or local health departments as well as private providers. In general, most family planning clinics do not appear to make a distinction for eligibility purposes between documented and undocumented people as long as they are residents. Clinics and their locations in the six regions are identified in table 6.21.

In interviews along the U.S. side of the border, researchers were often told that increased funding would permit an expansion of services which were currently oversubscribed.

6.5 Prenatal Care

According to information noted in chapter 3, there seems to be a definite trend towards fewer mothers on the border giving birth without prenatal care. Information from birth certificates, with all their limitations, has the virtue of providing an overview of all mothers. Utilization data for private offices is not available.

There are numerous programs funded at both the state and federal levels with the avowed objective of improving maternity outcomes. In fact "at least 70 U.S. federal programs administered by several agencies can and do affect pregnancy outcome."[5] Coverage of the population in the border counties is certainly varied and nearly impossible to determine precisely since, even with government funded programs such as Medicaid, there is a great deal of private office utilization. This is further complicated by the multiple eligibility that many people have for various federal, state and local programs.

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[5] U.S. General Accounting Office, Better Management and More Resources Needed to Strengthen Federal Efforts to Improve Pregnancy Outcome, (GRD-80-24), Washington, D.C.: January 1980.

The task of finding clear targets of opportunity for significant interventions for prenatal care in the U.S. border counties is made difficult by the lack of clear markers, such as low birth weights and high infant mortality rates in these counties. The U.S.-Mexico Border Fertility Survey[6] provides some population-based data on prenatal and delivery care (table 6.22). Almost 6% of the Mexican-American women had no prenatal care for their most recent birth compared to less than 1% of the Anglo women. Of those women who obtained prenatal care, Mexican-Americans were less likely to do so in the first three months of pregnancy. The prenatal care was less likely to be obtained from a private physician or clinic, and was more likely to come from non-military hospitals, health departments, or service providers in Mexico.

Probably because of the presence of birthing clinics such as Su Clinica, the place of delivery for Mexican-American women was not so different than for Anglo women. The Mexican-American women were slightly more likely to use non-military (as opposed to military) hospitals or private clinics, or the birth occurred in Mexico. The Mexican-American women were less likely to obtain a post-partum check-up, and were less likely to have breast-fed their baby. This latter finding is of some concern because, between babies born from 1971 to 1975 and babies born from 1976 to 1979, breast feeding among Mexican-American women appears to have declined, while among Anglo women, it has become more popular.

6.6 Accessibility of Care

Although concrete figures are difficult to come by, some discussion of eligibility requirements for programs along the U.S. side of the border is certainly warranted. For the poor and near poor there are essentially three overlapping systems through which medical and hospital care can be obtained or financed. These are the Medicaid system, the clinic system provided by city or county health departments and other entities generally funded by federal grants, and public hospitals along with teaching hospitals.

6.6.1 The Medicaid System

The Medicaid system is quite different in each of the states of California, Arizona, and Texas. In California, in addition to covering AFDC and SSI recipients, Medicaid (Medi-Cal) also covers medically needy and medically indigent categories. The medically needy are those who are aged 65 or older, blind or disabled, and have family circumstances in keeping with AFDC eligibility guidelines, but whose income is sufficiently high to disqualify them for cash grants. Medically indigent persons include those who do not meet the

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[6] J.C. Smith, C.W. Warren, and J. Garcia-Nunez, The U.S.-Mexico Border: Contraceptive Use and Maternal Health Care in Perspective, 1979 (El Paso: United States-Mexico Border Health Association, 1983).

AFDC or SSI criteria, yet whose incomes are inadequate. Table 6.23 shows that in both San Diego and Imperial counties in 1979, families and children accounted on average for about 60% of the medical eligibles, about 50% of Medicaid users in any one month, and about 35% of the Medicaid expenditures for the year.

Federal legislation specifically prohibits the use of Medicaid funds for any non-permanent resident of the United States. Similarly, California law prohibits the use of Medi-Cal funds by nonresidents.

Arizona for many years has been the only state not participating in the Medicaid program. In the fall of 1981, with the help of waivers from the federal government, Arizona passed the Arizona Health Care Cost Containment System (AHCCCS), a three-year demonstration program. In addition to Title XIX mandated participants, the AHCCCS establishes an income/resources standard for indigents and medically needy people and allows for the participation of state, county, and business employees with no public subsidy. The program is managed by a private administrator under contract with the Arizona Department of Health with services to be paid on a capitation basis. AHCCCS is funded by a combination of county, state, federal, and private (for business employees) contributions. Although it is too early to evaluate the impact of the AHCCCS system, it is clear that services for mothers and children will be more fully funded than under the previous county welfare system.

Until recently, the Texas Medicaid system was limited to the categorical AFDC and SSI eligibles mandated by federal law. Consequently a very large number of people in intact families whose incomes were at or below the poverty level were ineligible for AFDC and therefore Medicaid. In 1985, as a result of somewhat liberalized federal guidelines, the Texas Legislature expanded Medicaid to cover a limited number of medically needy children and pregnant women. Perhaps of greater importance, the legislature defined the respective indigent care responsibilities of counties, public hospitals, and hospital districts, and provided limited funds to assist communities with insufficient funds to meet those responsibilities.

The limited nature of the Medicaid system in Texas can be dramatized by comparison of food stamp and Medicaid expenditures (table 6.24). In each of the six principal border counties, the value of food stamps disbursed in Fiscal Year 1979-80 was larger than the sum of total AFDC and Medicaid payments including nursing home expenditures. Texas Medicaid has trailed behind almost every other state in terms of coverage of the poor. Also in Texas, it is virtually impossible for an undocumented alien to become eligible for and receive Medicaid. In fact, in both Texas and California, hospitals are quite aggressive in requiring patients without financial resources to apply for Medicaid. Undocumented aliens are unwilling to do so for fear of being detected and possibly deported.

6.6.2 Ambulatory Clinics

Primary sources of health care for the poor along the border, and elsewhere, are the clinics maintained by the cities and counties, as well as by private groups. Funds for these clinics generally come from state and federal resources. In the Texas counties in particular, where Medicaid does not cover a high proportion of the medical needs of the indigent, there are some migrant and rural health clinics, along with the resources provided by the state health department, to help fill in the gaps at least so far as ambulatory care is concerned. In general, care in these clinics is limited to clinic enrollees who must show proof of residence such as an electric bill, rent check, or drivers license. There is often little concern with regard to whether or not the person is undocumented. Certain services such as immunizations, tuberculosis testing, or checks for sexually transmitted diseases are not restricted in availability by either recipient's income or place of residence.

6.6.3 Public Hospitals

In most urban areas in the United States, the public hospital fills the gaps in the health system between the insured and well-to-do and those covered by Medicaid. With a public hospital, the uninsured have a place to go for hospital care. On the U.S. side of the U.S.-Mexican border there is only one major public hospital, R. E. Thomason General Hospital in El Paso. Both Val Verde and Maverick counties have county hospitals, but their tax base is very small. Although the medically indigent of El Paso can be treated on an ability to pay basis, undocumented alien residents in El Paso are not eligible for care. R. E. Thomason developed a program that allows the associate director of a maternity clinic/family planning program in Juarez to work half-time at the hospital to help Mexican nationals who are residents in El Paso find care in Juarez for which they are eligible.

The lack of public facilities along the border is probably caused in part by the unwillingness of the local taxpayers to bear such a disproportionate burden for medical care. The unavailability of such facilities has caused difficulties in each of the regions except El Paso.

In the Lower Rio Grande Region, both the lack of a public facility and the quite limited charity-care policies on the part of the local hospitals have meant that roughly 4,000 local residents each year choose to give birth out of the hospital. The development of certified nurse midwife birthing programs at Su Clinica Familiar and more recently at the Brownsville City Health Department and the Hidalgo County Health Care Corporation have meant that many poor mothers have had professional care. In general, if a pregnant woman can document residence, undocumented alien or not, she can receive obstetric care at these certified nurse midwife clinics. However, when pregnancy presents a dangerous or complicated case the lack of public facilities becomes serious. Although the federally funded programs have worked out some referral arrangements with the local hospitals, the expenses are overwhelming for the local projects. The Texas Legislature in 1983 authorized the Texas Department of Health to expand services at the Chest Hospital in Harlingen to cover other activities, but did not appropriate additional funds for this purpose. In 1985, the legislature did provide funds to the Texas Department of Health to purchase primary care and maternal and infant health services from local programs.

In the Mid-Rio Grande Region, although Maverick and Val Verde counties have county hospitals, Webb County has only a proprietary hospital and a voluntary hospital. Once again, obstetrical care is a problem and the Webb County Health Department proposes to develop a certified nurse midwife program.

In southeastern Arizona, the lack of a public hospital means that indigents from both sides of the border come to the University of Arizona Health Sciences Center in Tucson for care, and the costs borne by that facility are substantial.[7]

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[7] Jeanne S. Newmann and Andrew Nichols, "Cost Recovery from Utilization of the University of Arizona Health Sciences Center by Mexican Nationals, Abstract 1977-1978 and 1979-1980," in Proceedings, Border Health Focused Research Agenda Development Conference, (Tucson: Westward Look Resort, September 20-22, 1981).

TABLE 6.1

HOSPITAL UTILIZATION IN PRINCIPAL TEXAS BORDER REGIONS
REGION 1: LOWER RIO GRANDE
(HIDALGO AND CAMERON COUNTIES)

Facilities and Use	1972	1975	1978	1980	1981
Hospital Beds	549	1,018	1,168	--	1,256
Patient Days	--	270,257	258,533	--	321,192
Obstetric Admissions	--	7,830	10,262	11,374	11,055
Obstetric Patient Days	--	20,888	25,083	31,319	28,547
Obstetric Average Length of Stay	--	2.67	2.44	2.75	2.58
Pediatric Admissions	--	4,274	6,517	7,046	7,507
Pediatric Patient Days	--	20,771	28,482	30,382	27,616
Pediatric Average Length of Stay	--	4.86	4.37	4.31	3.68
Hospital Expenditures (x 1,000)		$10,783		$57,651	

TABLE 6.1 (Cont.)

REGION 2: MID-RIO GRANDE (WEBB, MAVERICK, AND VAL VERDE COUNTIES)

Facilities and Use	1972	1975	1978	1980	1981
Hospital Beds	376	475	475	--	475
Patient Days	--	117,232	123,591	--	144,457
Obstetric Patient Days	--	12,042	12,506	14,992	15,957
Obstetric Admissions	--	4,597	5,038	5,828	6,219
Obstetric Average Length of Stay	--	2.62	2.48	2.57	2.57
Pediatric Patient Days	--	9,689	11,173	12,835	13,005
Pediatric Admissions	--	2,739	3,190	3,641	3,674
Pediatric Average Length of Stay	--	3.54	3.50	3.53	3.54
Hospital Expenditures (x 1000)	$6,424	$8,140			$15,632*

TABLE 6.1 (Cont.)

REGION 3: EL PASO (EL PASO COUNTY)

Facilities and Use	1972	1975	1978	1980	1981
Hospital Beds	--	2,216	2,491	--	2,471
Patient Days	--	408,929	461,147	--	471,772
Obstetric Patient Days	--	52,470	35,824	53,442	48,508
Obstetric Admissions	--	9,781	13,881	14,989	13,301
Obstetric Average Length of Stay	--	5.36	2.58	3.57	3.65
Pediatric Patient Days	--	30,793	32,409	29,185	37,812
Pediatric Patient Admissions	--	3,824	8,478	7,116	12,518
Pediatric Average Length of Stay	--	8.05	3.82	4.10	3.02
Hospital Expenditures+ (x 1000)	--	$38,538	--	$82,501	--

Sources: Texas Department of Health, Health Facilities and Utilization, volumes for 1978-1981.

Texas Department of Health facilities and utilization printout for 1982.

* 1980 hospital expenditure data from AHA Guide issue does not include Maverick County.

+ Expenditures from the American Hospital Association Hospital Guide for that year.

TABLE 6.2

HOSPITAL BEDS AND EXPENDITURES IN ARIZONA AND CALIFORNIA BORDER REGIONS

	1972	1975	1980
Region 4 - Cochise, Santa Cruz and Pima Counties			
Beds	2,463	2,785	2,882
Expenditures (x 1000)	$59,480	$106,121	$223,029
Region 5 - Yuma and Imperial Counties			
Beds	129	297	277
Expenditures (x 1000)	$2,312	$9,354	$23,955
Region 6 - San Diego County			
Beds	6,383	7,728	7,408
Expenditures (x 1000)	$124,841	$278,481	$406,526

Source: American Hospital Association, Guide to the Health Care Field, 1972, 1975, 1980 (Chicago, Illinois).

TABLE 6.3

GENERAL ACUTE CARE HOSPITAL BEDS IN IMPERIAL AND SAN DIEGO COUNTIES YEARS 1983 AND 1985

	Imperial		San Diego	
Year	1983	1985	1983	1985
General Acute Care Beds	206	216	5,383	5,705
Medical/Surgical Beds	131	136	3,916	4,083
Pediatric Beds	24	24	326	297
Perinatal Bed	30	32	373	381
Newborn ICU Beds	4	4	78	132
Other Beds	17	20	690	812

	Imperial		San Diego	
Occupancy, 1983	Patient Days	Percent Occupancy	Patient Days	Percent Occupancy
General Acute Care Beds	54,129	72.0	1,264,221	64.3
Medical/Surgical Beds	38,016	79.5	956,351	66.9
Pediatric Beds	4,763	54.4	53,264	44.8
Perinatal Beds	5,775	52.7	68,479	50.3
Newborn ICU Beds	980	67.1	26,821	94.2

Source: Health Systems Agency of San Diego and Imperial counties, 1985 Health Systems Plan Amendment, San Diego, 1985.

Note: Patient days are calculated on the basis of bed utilization, not licensure.

TABLE 6.4

PATIENT ORIGINS FOR TEXAS BORDER FACILITY ADMISSIONS, 1979

		Percent of Total Admissions				
Facility Location	Sample Total Facility Admissions	Same County	Other Border County[A]	On-Border County	Other States	Mexico
Cameron	1,504 (100%)	82.3	12.0	1.8	2.3	1.5
Hidalgo	2,230 (100%)	89.5	7.4	1.1	1.2	0.9
Webb	1,159 (100%)	87.5	3.5	5.1	0.4	3.5
Maverick	233 (100%)	86.7	0.4	7.3	1.3	4.3
Val Verde[B]	90 (100%)	97.8	2.2	0	0	0
El Paso	5,370 (100%)	83.4	0.5	0.9	12.9	2.3
Total	10,586 (100%)	85.2	3.9	1.7	7.2	2.0

Source: Ann E. Henry, Texas-Mexico Border Area Migration for Acute Care Hospital Admission, Working Paper No. 22 (Austin: Lyndon B. Johnson School of Public Affairs, 1983).

A. Resident of any of 15 Texas border counties except county where facility is located.

B. Excludes data from one military facility.

TABLE 6.5

PATIENT DESTINATIONS FROM PRINCIPAL TEXAS COUNTIES, 1979

		Percent Distribution of Location of Admissions							
				Selected Texas Metro Counties					
County of Residence	Total Admissions	Same County	Other Border County*	Bexar	Dallas	Galveston	Harris	Nueces	Other Texas Counties
Cameron	1,442 (100%)	85.9	3.7	4.6	0	1.0	2.0	1.4	1.5
Hidalgo	2,317 (100%)	86.1	4.8	3.5	0.3	0.3	1.9	1.5	1.6
Webb	1,170 (100%)	86.7	0.3	9.1	0	0.2	1.1	1.0	1.6
Maverick	275 (100%)	73.5	0.7	22.5	0	1.5	0.4	0	1.5
Val Verde	208 (100%)	42.3	1.9	47.6	0.5	1.0	0.5	0	6.3
El Paso	4,555 (100%)	98.3	0	0.4	0.2	0	0.4	0	0.6
Total	9,967 (100%)	90.5	1.7	4.4	0.2	0.3	1.1	0.7	1.2

Source: Ann E. Henry, Texas-Mexico Border Area Migration for Acute Care Hospital Admission, Working Paper No. 22 (Austin: Lyndon B. Johnson School of Public Affairs, 1983).

* Admitted to a facility located in any of 15 Texas border counties excluding county of residence.

TABLE 6.6

ADMISSION BY SERVICE AND FOR SELECTED AGE GROUPS FOR RESIDENTS OF SIX TEXAS BORDER COUNTIES, 1979

		Percent of Admissions			
		Service			
Patient Residence	Total Sample Admissions	Obstetric*	Pediatric	Women 15-44	Children 1-14
Cameron	1442	15.0	9.2	31.1	11.5
Hidalgo	2,317	16.7	13.2	33.1	14.4
Webb	1,170	19.8	17.3	33.8	18.5
Maverick	275	14.2	19.6	30.2	21.5
Val Verde	208	7.7	11.5	31.3	15.4
El Paso	4,555	15.6	9.8	34.4	11.9
Total	9,967	16.0	11.7	33.4	13.5

Source: Ann E. Henry, Texas Mexico Border Area Migration for Acute Care Hospital Admission, Working Paper No. 22 (Austin: Lyndon B. Johnson School of Public Affairs, 1983).

* Women ages 15-44 only.

TABLE 6.7

COMPARISON OF TEXAS HOSPITAL ADMISSIONS BY TEXAS BORDER RESIDENTS AND MEXICO RESIDENTS, 1979-80

	Place of Residence	
	Six Texas Border Counties	Mexico
Texas Hospital Admissions[A]	9,967 (100%)	416 (100%)
Obstetric[B]	16.0%	19.7%
Pediatric	11.7%	6.5%
Women Ages 15-44	33.4%	38.7%
Children 1-14	13.5%	8.7%
Obstetric Admissions[B]	1,597	82
Served on Border[C]	99.2%	92.7%
Non-Obstetric Admissions	8,370	334
Served on Border[C]	90.9%	41.3%

Source: Ann E. Henry, Texas Mexico Border Area Migration for Acute Care Hospital Admission, Working Paper No. 22 (Austin: Lyndon B. Johnson School of Public Affairs, 1983).

A. Admission to any Texas hospital during the 4-week sample period in 1979-80.
B. Obstetric admissions among women ages 15-44.
C. Hospitalized in any of 15 Texas border counties.

TABLE 6.8

MIGRATION FOR BIRTH IN AND OUT OF PRINCIPAL BORDER COUNTIES, TEXAS AND ARIZONA, 1970 AND 1980

	Births to Residents		Out-Migrating Births		In-Migrating Births		Births by Occurrence	
County	1970	1980	1970	1980	1970	1980	1970	1980
Cameron	4,115	5,489	299	156	1,505	1,594	5,321	6,927
Hidalgo	5,669	7,614	150	237	1,724	1,161	7,243	8,538
Webb	2,281	2,643	33	32	1,347	1,010	3,595	3,621
Maverick	452	844	23	42	216	251	645	1,053
Val Verde	875	871	31	20	234	161	1,078	1,012
El Paso	9,275	9,915	71	48	2,166	1,928	11,370	11,795
Cochise	1,371	1,569	112	198	121	140	1,380	1,511
Santa Cruz	297	498	26	261	56	73	327	310
Pima	6,735	8,916	148	63	335	1,043	6,922	9,896
Yuma	1,393	1,742	91	181	206	112	1,508	1,673
Total	32,463	40,101	984	1,238	7,910	7,473	39,389	46,336

Sources: Birth tapes provided by Texas and Arizona health departments.

TABLE 6.9

BIRTH MIGRATION RATIOS FOR PRINCIPAL BORDER COUNTIES, TEXAS AND ARIZONA, 1970 AND 1980

	Ratio of In-to Out-Migrating Births		Out-Migrating as Percent of Resident Births		In-Migrating as Percent of Occurring Births	
County	1970	1980	1970	1980	1970	1980
Cameron	5.0	10.2	7.3	2.8	28.3	23.0
Hidalgo	11.5	4.9	2.6	3.1	23.8	13.6
Webb	40.8	31.6	1.4	1.2	37.5	27.9
Maverick	9.4	6.0	5.1	5.0	33.5	23.8
Val Verde	7.5	8.0	3.5	2.3	21.7	15.9
El Paso	30.5	40.2	0.8	0.5	19.1	16.3
Cochise	1.1	0.7	8.2	12.6	8.8	9.3
Santa Cruz	2.2	0.3	8.8	52.4	17.1	23.5
Pima	2.3	16.6	2.2	0.7	4.8	10.5
Yuma	2.3	0.6	6.5	10.4	13.7	6.7
Total	8.0	6.0	3.0	3.1	20.1	16.1

Source: Birth tapes provided by Arizona health department.
Texas Department of Health, Migration for Birth, 1980.

TABLE 6.10

BIRTH ATTENDANT BY BIRTH MIGRATION STATUS FOR PRINCIPAL BORDER COUNTIES, TEXAS AND ARIZONA, 1970 AND 1980

		Non-Migrating Residents		Out-Migrating Births		In-Migrating Births	
County	Birth Attendant	1970	1980	1970	1980	1970	1980
Cameron	Physician	2,571	3,579	305	144	259	464
	Nurse	0	718	0	0	0	0
	Midwife/Other	1,245	1,036	3	12	1,246	1,127
Hidalgo	Physician	4,802	6,593	132	200	1,363	827
	Nurse	0	3	0	0	0	0
	Midwife/Other	717	781	18	37	361	334
Webb	Physician	2,041	2,416	31	30	501	533
	Nurse	0	0	0	0	0	0
	Midwife/Other	207	195	2	2	37	846
Maverick	Physician	313	719	23	41	88	206
	Nurse	0	0	0	0	0	0
	Midwife/Other	116	83	0	0	128	45
Val Verde	Physician	802	828	31	19	185	136
	Nurse	0	5	0	0	0	0
	Midwife/Other	42	18	0	1	49	25
El Paso	Physician	9,176	9,017	70	43	2,140	1,456
	Nurse	0	53	0	1	0	0
	Midwife/Other	28	797	1	4	26	462
Cochise	Physician	1,255	1,340	92	195	121	139
	Nurse	2	12	0	3	0	1
	Midwife/Other	2	19	0	0	0	0
Santa Cruz	Physician	269	222	26	256	54	70
	Nurse	0	2	0	1	0	0
	Midwife/Other	2	13	0	4	2	3
Pima	Physician	6,540	8,165	147	59	330	1,029
	Nurse	11	74	0	0	1	11
	Midwife/Other	36	614	1	4	4	13
Yuma	Physician	1,290	1,544	91	176	204	111
	Nurse	0	0	0	0	0	0
	Midwife/Other	12	17	0	5	2	1

Sources: Birth tapes provided by Arizona health department.
Texas Department of Health, Migration for Birth, 1980.

TABLE 6.11

PLACE OF BIRTH BY MIGRATION STATUS FOR PRINCIPAL TEXAS BORDER COUNTIES, 1970 AND 1980

		Non-Migrating Residents		Out-Migrating Births		In-Migrating Births	
County	Institution	1970	1980	1970	1980	1970	1980
Cameron	Hospital/Med. Ctr.	2,452	3,524	291	135	249	47
	Maternity Home	0	751	0	9	0	5
	Home/Other						
Hidalgo	Hospital/Med. Ctr.	4,782	751	1	12	0	420
	Maternity Home	0	1,576	1	12	0	420
	Home/Other	737	784	18	33	362	334
Webb	Hospital/Med. Ctr.	2,029	2,415	32	28	538	535
	Maternity Home	0	0	0	2	0	0
	Home/Other	219	196	1	2	809	475
Maverick	Hospital/Med. Ctr.	312	727	22	40	87	205
	Maternity Home	0	0	0	0	0	0
	Home/Other	117	85	1	2	129	46
Val Verde	Hospital/Med. Ctr.	796	715	30	19	183	101
	Maternity Home	0	0	1	0	0	0
	Home/Other	48	136	0	1	51	60
El Paso	Hospital/Med. Ctr.	9,116	9,050	65	44	2,012	1,449
	Maternity Home	54	574	4	0	127	365
	Home/Other	34	243	2	4	27	1

Source: Texas Department of Health, Migration for Birth, 1980.

TABLE 6.12

DESTINATIONS OF BIRTH OUT-MIGRANTS AMONG RESIDENTS OF PRINCIPAL TEXAS BORDER COUNTIES, BY INSTITUTION AND BIRTH ATTENDANT, 1980

			Non-Hospital Birth Attendant			
County of Residence	Birth Location	Hospital Birth	Physician	Certified Nurse/ Midwife	Midwife	Other
Cameron	Adjacent County	75	9	0	8	0
	Other County	39	0	0	3	1
	Out of State	21	0	0	0	0
Hidalgo	Adjacent County	105	10	0	31	0
	Other County	27	1	0	2	0
	Out of State	60	1	0	0	0
Webb	Adjacent County	1	0	0	1	0
	Other County	22	2	0	0	0
	Out of State	5	0	0	0	0
Maverick	Adjacent County	5	0	0	1	0
	Other County	24	1	0	0	0
	Out of State	11	0	0	0	0
Val Verde	Adjacent County	1	0	0	0	0
	Other County	17	0	0	1	0
	Out of State	1	0	0	0	0
El Paso	Adjacent County	0	0	0	1	0
	Other County	18	0	0	0	1
	Out of State	26	1	0	0	1
Total	Adjacent City	187	19	0	42	0
	Other County	147	4	0	6	2
	Out of State	124	2	0	0	1

Source: Texas Department of Health, Migration for Birth, 1980.

TABLE 6.13

ORIGINS OF BIRTH IN-MIGRANTS TO PRINCIPAL TEXAS BORDER COUNTIES, BY INSTITUTION AND BIRTH ATTENDANT, 1980

			Non-Hospital Birth Attendant			
County of Birth	Residence	Hospital Birth	Physician	Certified Nurse/ Midwife	Midwife	Other
Cameron	Adjacent County	276	2	3	34	0
	Other County	21	1	0	25	1
	Out of State	177	1	0	1050	3
Hidalgo	Adjacent County	270	53	0	15	0
	Other County	28	20	0	4	1
	Out of State	109	349	0	302	10
Webb	Adjacent County	219	0	0	6	0
	Other County	40	0	0	8	0
	Out of State	276	3	0	450	8
Maverick	Adjacent County	128	0	0	4	0
	Other County	21	0	0	7	0
	Out of State	56	1	0	33	1
Val Verde	Adjacent County	44	8	0	0	0
	Other County	43	3	0	3	1
	Out of State	14	24	0	16	5
El Paso	Adjacent County	29	0	0	2	0
	Other County	23	0	0	30	1
	Out of State	1,397	11	0	440	12
Total	Adjacent County	966	63	3	61	0
	Other County	176	24	0	50	4
	Out of State	2,029	389	0	2,291	39

Source: Texas Department of Health, Migration for Birth, 1980.

TABLE 6.14

SELECTED PERSONNEL BY REGION

Region	Total MDs-DOs	Pediatricians	GPs	FPs	OB--Gyn	Dentists	Registered Nurses	Vocational Nurses
Region 1[A]	368	23	49	61	25	42	341	408
Region 2[B]	107	11	13	12	11	25	213	--
Region 3[C]	575	47	[104]		67	--	--	--
Region 4[D]	1,396	81	56	98	59	--	5,216	1,688
Region 5[E]	156	12	--	--	--	50	--	--
Region 6[F]	3,800	171	418	73	--	--	--	--

Notes: A. 1981 data from Texas Board of Medical Examiners, Texas Board of Dental Examiners. Registered nurse data is from the Texas Board of Nurse Examiners, vocational nurse data is from Texas Board of Vocational Nurse Examiners, November 1978.

B. TMA 1980, "Physician Distribution by Specialty within County," Texas Health Manpower Reports and Directory of Medical Specialists. Texas Department of Health Bureau of State Health Planning and Resource Development, Selected Health Data for Texas 1977. Most of this appears to be 1977 data.

C. State Board of Medical Examiners, May 1982, unpublished computer printouts

D. Board of Medical Examiners, State of Arizona, September 1, 1981

E. Health Systems Agency, Western Arizona Health Plan, and Health Systems Agencies for San Diego and Imperial Counties, Health Systems Plan, 1980-1985.

F. The total figure for San Diego is a 1979 estimate by the Health Systems Agency. The pediatrician, general practitioner, and family practitioner data is from the 1978 California Health Plan for Children.

TABLE 6.15

NEED FOR CONTRACEPTION AMONG WOMEN AGES 15-44 IN 51 BORDERLAND COUNTIES U.S.–MEXICO BORDER SURVEY, 1979

Measure of Need	Mexican American	Anglo	Significance of Difference
Mean Number of Children Ever Born to Ever-Married Respondents Ages 15-19	0.80	0.69	None
20-24	1.48	0.87	p<.001
25-29	1.89	1.41	p<.001
30-34	2.88	1.98	p<.001
35-39	3.38	2.57	p<.001
40-44	4.77	3.05	p<.001
Mean Number of Children Ever Born to Women Ever-Married at Least 10 Years	4.30	2.84	p<.001
Percentage of Most Recent Live Births That Were Unwanted - Total	15.4	10.0	p<.05
- Age Standardized	13.4	7.8	p<.05
Percentage of Currently Married Women Currently Using Contraception--Total	65.5	75.2	p<.001
Ages 15-19	41.4	54.3	None
20-24	70.7	69.9	None
25-29	69.6	75.8	None
30-34	72.4	74.8	None
35-39	71.7	87.6	p<.01
40-44	47.7	69.8	p<.01

Source: J.C. Smith, C.W. Warren, and J. Garcia Nuñez, The U.S.–Mexico Border: Contraceptive Use and Maternal Health Care in Perspective, 1979 (El Paso: United States–Mexico Border Health Association, 1983).

TABLE 6.16

CURRENTLY MARRIED MEXICAN-AMERICAN RESPONDENTS BY CONTRACEPTION STATUS AND METHOD, U.S.–MEXICO BORDER SURVEY, 1979

Contraceptive Status	Ages 15-44	Ages 30-44	Ages 20-44*
Number of respondents	791	399	197
Currently Using	65.4%	65.0%	63.3%
Not Using - Pregnancy Related	15.9	9.1	9.9
- Sterile	8.6	14.8	10.9
- Unmet Need for Family Planning	10.1	11.1	15.9
	100%	100%	100%
Users, by Method			
Number	542	269	124
Sterilization - Female	19.3%	31.3%	32.6%
- Male	6.3	8.5	2.8
Pill	31.9	17.8	27.6
IUD	11.3	9.7	7.7
Injectable	2.8	2.6	6.0
Condom	11.5	11.2	7.3
Diaphragm	0.6	0.2	0.6
Foam	4.7	4.6	4.9
Rhythm	3.5	6.0	5.5
Withdrawal	7.6	7.2	5.0
Other	0.5	0.9	0.0
	100%	100%	100%

Source: J.C. Smith, C.W. Warren and J. Garcia Nuñez, The U.S.–Mexico Border: Contraceptive Use and Maternal Health Care in Perspective, 1979 (El Paso: United States–Mexico Border Health Association, 1983).

* 0-7 years education.

TABLE 6.17

SOURCES OF BIRTH CONTROL PILLS, IUDs AND FEMALE STERILIZATION AMONG WOMEN CURRENTLY MARRIED AGES 15-44 U.S.-MEXICO BORDER SURVEY, 1979

	Pill		IUD		Female Sterilization	
	Mex-Am.	Anglo	Mex-Am.	Anglo	Mex-Am.	Anglo
Number of Users	200	129	53	36	91	63
Source						
Private physician or clinic	47.4	83.5	41.1	76.5	12.2	18.4
Planned Parenthood/ Health Department	32.5	2.2	45.0	4.4	2.7	0.0
Hospital, Non-Military	8.8	1.2	8.7	6.2	77.7	66.7
Hospital, Military	0.8	11.5	2.4	12.9	2.9	13.3
Mexico	10.3	--	2.8	--	4.5	--
Others	0.2	1.6	0.0	0.0	0.0	1.6
	100%	100%	100%	100%	100%	100%

Source: J.C. Smith, C.W. Warren, and J. Garcia Nuñez, The U.S.–Mexico Border: Contraceptive Use and Maternal Health Care in Perspective, 1979 (El Paso: United States–Mexico Border Health Association, 1983).

TABLE 6.18

PERCENT OF EVER-MARRIED RESPONDENTS, AGES 15-44, IN NEED OF FAMILY PLANNING SERVICES AND NOT USING CONTRACEPTION, U.S.-MEXICO BORDER SURVEY, 1979

	Mexican-American		Anglo	
	Number*A	Percent*B	Number*A	Percent*B
Total ever-married respondents	913	10.6	636	3.8
Ages 15-24	214	11.4	133	6.2
25-34	435	6.7	311	5.0
35-44	214	15.5	192	1.2
Under 200% Poverty	517	11.4	129	4.9
Above 200% Poverty	308	6.6	452	4.0
Ages 20-44				
0-7 years of school	226	14.4	4	--
8-11 years of school	220	11.0	68	5.4
12 years of school	268	7.0	253	2.2
13+ years of school	145	8.8	295	4.5

Source: J.C. Smith, C.W. Warren, and J. Garcia Nuñez, The U.S.–Mexico Border: Contraceptive Use and Maternal Health Care in Perspective, 1979 (El Paso: United States–Mexico Border Health Association, 1983).

* A. Number of respondents in category.
* B. Percentage in need and not using contraception.

TABLE 6.19

PERCENT OF NEVER-MARRIED RESPONDENTS AGES 15-44, IN NEED OF FAMILY PLANNING SERVICES AND NOT USING CONTRACEPTION, U.S.-MEXICO BORDER SURVEY, 1979

	Mexican-American		Anglo	
	Number[A]	Percent[B]	Number[A]	Percent[B]
Total Never-Married Respondents	326	8.0	162	8.2
Ages 15-19	195	5.9	100	9.9
Ages 20-44	131	11.7	62	5.3

Source: J.C. Smith, C.W. Warren, and J. Garcia Nuñez, The U.S.–Mexico Border: Contraceptive Use and Maternal Health Care in Perspective, 1979 (El Paso: United States–Mexico Border Health Association, 1983).

A . Number of respondents in category.
B. Percent in need and not using contraception.

TABLE 6.20

ATTITUDES OF CURRENTLY MARRIED WOMEN AGES 15-44 TOWARD PROVIDER, U.S.-MEXICO BORDER SURVEY, 1979

	Mexican-American	Anglo
Number of respondents not using contraceptives	219	117
Accept services from medical person other than physician?		
Yes	79.7	81.9
No	15.7	10.8
Don't Care	3.8	7.3
No Answer	0.8	0.0
	100%	100%
Prefer services from male or female?		
Male	10.3	15.6
Female	46.2	16.3
Doesn't matter	43.5	68.1
	100%	100%

Source: J.C. Smith, C.W. Warren, and J. Garcia Nuñez, The U.S.-Mexico Border: Contraceptive Use and Maternal Health Care in Perespective, 1979 (El Paso: United States-Mexico Border Health Association, 1983).

TABLE 6.21

CLINICS OFFERING FAMILY PLANNING SERVICES IN BORDER COUNTIES, 1980

Region 1	Clinic Location (s)
Planned Parenthood of Cameron and Willacy Counties	4 Clinics in Brownsville, Harlingen, San Benito and Raymondville
Texas Department of Health, Public Health Region 8	14 Locations in Harlingen, Port Isabel, Brownsville, Los Fresnos, San Benito, Weslaco, Pharr, Elsa, Donna, Mercedes Million, and Edinburg (2)
Family Health Services Clinic	Harlingen
Brownsville Community Health Clinic	Brownsville
Planned Parenthood of Hidalgo County	5 Clinics in McAllen, Mission, Edinburg, Pharr and Weslaco
Hidalgo County Health Care Corp.	McAllen, Mercedes, and Edcouch
Region 2	
Laredo-Webb County CAP, Laredo	Laredo (2)
Family Planning Services	Laredo
Catholic Charities	Laredo
New Women's Clinic	Laredo
Texas Department of Health, Southwest Van Program	Quemado and Del Rio
Maverick County Hospital District	Eagle Pass
Region 3	
Catholic Counseling Service	El Paso
Planned Parenthood	El Paso
R. E. Thomason General Hospital	El Paso
Texas Tech University, Department of Obstetrics	El Paso

TABLE 6.21. (Cont.)

Region 3 (cont.)	Clinic Location(s)
Nova Health Systems	El Paso
Family Planning Institute of Texas	El Paso
Region 4	
El Rio Santa Cruz Neighborhood Center	Tucson
Pima County Family Planning Planned Parenthood of Southern Arizona	Tucson Pima County
Planned Parenthood	Sierra Vista and Douglas
Santa Cruz County Family Planning	Nogales
Region 5	
Yuma County Health Department	Yuma
Clinicas de Salud del Pueblo	Brawley
E.O.C. Family Planning Program	El Centro
Region 6	
Beach Area Community Clinics	San Diego
Chicano Community Health Clinic	San Diego
Planned Parenthood Clinics	East San Diego, El Cajon, Escondido, North San Diego, Oceanside, South Bay, Southeast, and Vista
Mercy Clinic	San Diego
San Ysidro Health Center	San Ysidro
Family Planning Department of Health Services	San Diego
North County Health Services	San Marcos

Sources: Texas clinics: Texas Department of Health. Arizona clinics: Department of Health and Human Services, Region IX, Annual Reports 1980.
Arizona Family Planning Council Report, Family Planning in Arizona 1980 Arizona State Health Plan.

TABLE 6.22

SELECTED BIRTHING DATA FOR CURRENTLY MARRIED WOMEN AGES 15-44 U.S.-MEXICO BORDER FERTILITY SURVEY, 1979

	Mexican-American	Anglo
Currently Married Respondents with Prior Childbirth	701	456
Without Prenatal Care	5.7%	0.5%
With Prenatal Care	94.3%	99.5%
Prenatal Care Began		
First Trimester	79.4%	91.9%
Second Trimester	18.8%	7.1%
Third Trimester	1.8%	1.0%
	100%	100%
	(658)	(455)
Source of Prenatal Care		
Private physician/clinic	67.1%	79.5%
Hospital-Non-military	10.2%	3.9%
Hospital-Military	3.2%	10.8%
Health Department	13.4%	2.6%
Mexico	4.9%	0.2%
Other	1.3%	3.0%
	100%	100%
	(623)	(455)
Place of Delivery		
Hospital-Non Military	86.5%	82.8%
Hospital-Military	2.9%	11.0%
Private Clinic	3.8%	2.1%
Mexico	4.0%	0.2%
Other	2.8%	3.9%
	100%	100%
	(691)	(455)
Percent with Post-Partum Checkup	86.4%	96.8%
	(693)	(446)
Percent Who Breastfed Their Most Recent Infant		
Birth in 1971-75	25.7%	31.1%
Birth in 1976-79	21.1%	47.1%
Percentage Change	-4.6%	+16.0%

Source: J.C. Smith, C.W. Warren, and J. Garcia Nuñez, The U.S.–Mexico Border: Contraceptive Use and Maternal Health Care in Perspective, 1979 (El Paso: United States–Mexico Border Health Association, 1983).

Note: The Border Fertility Study sampled 2,135 women of fertile age (15-44) in 51 U.S. Counties on or near the border. In Texas, San Antonio and Corpus Christi were included in the sampling frame.

TABLE 6.23

MEDICAID USERS AND ELIGIBLES EXPENDITURES BY CATEGORY: IMPERIAL AND SAN DIEGO COUNTIES, 1979

County	Total All Categories	Public Assistance			
		Aged	Blind	Disabled	Families
Imperial					
Average Monthly Eligibles	15,721	2,217	70	1,958	6,498
Average Monthly Users	7,343	1,263	45	1,253	2,418
Annual Payments	$13,586,045	1,401,146	84,665	2,511,331	2,785,851
San Diego					
Average Monthly Eligibles	167,647	18,720	883	20,188	82,583
Average Monthly Users	92,430	12,944	570	14,361	36,175
Annual Payments	$190,835,645	13,741,074	1,057,726	37,386,646	45,585,716

TABLE 6.23 (Cont.)

	Medically Needy				Medically Indigent	
County	Aged	Blind	Disabled	Families	Adults	Children
Imperial						
Average Monthly Eligibles	383	-	149	2,162	1,247	1,038
Average Monthly Users	317	1	118	817	731	372
Annual Payments $	1,387,354	14,549	503,314	1,652,726	2,546,731	698,364
San Diego						
Average Monthly Eligibles	5,325	47	1,701	11,781	17,512	8,872
Average Monthly Users	4,963	47	1,521	5,981	11,608	4,234
Annual Payments $	26,794,109	275,879	7,690,914	11,665,376	37,534,980	8,988,537

Source: California Center for Health Statistics, "California's Medical Assistance Program Annual Statistical Report," Data Matters, Calendar Year 1979, March 1981.

Notes: "Public Assistance" includes those persons on welfare, SSI, or AFDC who are automatically covered by Medicaid in all states with a program. "Medically needy" are those who meet the aged, blind, disabled, or AFDC criteria but whose incomes are somewhat above that needed for cash grants. At the state's option they can be included in Medicaid, similarly for those who are poor but don't meet the AFDC or SSI criteria.

TABLE 6.24

MEDICAID EXPENDITURES AND FINANCIAL ELIGIBILITY DATA ON SELECTED PROGRAMS IN THE PRINCIPAL TEXAS BORDER COUNTIES, SEPTEMBER 1979 - AUGUST 1980

	Nursing Homes Private ICF-MR					
County	Clients	Payments $	Prescribed Medicines $	Hospitals, MD Services X-ray & Lab $	Other Services $	Total Medicaid Expenditures $
Cameron	927	4,988,736	1,242,607	7,541,303	393,588	14,166,233
Hidalgo	1,081	5,453,917	2,290,851	9,450,904	750,061	17,945,732
Webb	424	2,111,192	848,666	3,782,889	192,214	6,934,962
Maverick	90	432,512	209,507	1,603,106	65,402	2,310,527
Val Verde	118	551,309	186,991	845,881	49,445	1,633,625
El Paso	880	4,456,364	1,379,394	11,156,554	587,172	17,579,483

County	Food Stamp Value $	AFDC Payments $	Active Medicaid Eligibles (Monthly Average)
Cameron	23,727,075	4,077,102	18,912
Hidalgo	39,196,731	6,123,731	27,483
Webb	11,841,534	1,566,988	8,579
Maverick	3,592,107	561,447	2,762
Val Verde	2,872,996	454,746	2,159
El Paso	28,213,487	4,885,992	20,574

Source: Texas Department of Human Resources, "A Time to be Resourceful," Annual Report, Austin, 1980.

CHAPTER 7

HEALTH RESOURCES AND UTILIZATION ON MEXICO'S NORTHERN BORDER

Most health care in Mexico is provided by the public sector (table 7.1). The principal public institutions providing care are the Instituto Mexicano de Seguro Social (IMSS), the Instituto de Seguridad y Servicios Sociales para los Trabajadores del Estado (ISSSTE), and Servicios Coordinados de Salud Publica en los Estados (Salud Publica). IMSS (Mexican Institute of Social Security) provides social security benefits and health care for many classes of private sector workers. The worker, employer and government share in the cost of the program. ISSSTE (Institute of Security and Social Services for the Workers of the State) was created in 1960 and provides social security coverage and health care for governmental workers. Although SSA (Secretaria de Salubridad y Asistencia--Secretary of Health and Welfare) technically refers to the cabinet level office which oversees all public health and welfare functions, in practice the acronym is often used to refer to Salud Publica (Public Health) which administers the SSA's direct responsibility for environmental health and sanitation, communicable disease control, and a variety of public health activities including health care for the poor.[1]

Other sources of health care in Mexico include PEMEX (Petroleos Mexicanos), the national oil industry which insures and provides health care for its workers; the Instituto de Seguridad Social para las Fuerzas Armadas (Social Security Institute for the Armed Forces); Ferrocarriles Nacionales (National Railroads); Comision Federal de Electricidad (Federal Electric Commission); and other coverage plans for selected workers groups. Private care is a relatively minor component of Mexico's health care system.

Mexico's health care resources are not sufficient to meet the needs of the people. According to COPLAMAR, a national agency charged with coordinating development of depressed areas, Mexico's health care resources including private care were sufficient to address the health needs of only 55% of Mexico's 1978 population. The public and quasi-public agencies were deemed capable of serving 42.4% of the need. The private sector was estimated to be capable of serving only 12.3% of the need.

7.1 Eligibility

In Mexico's six northern border states, an estimated 61% of the population was eligible for health care under the respective social security programs in 1979 (table 7.2). This proportion ranged from 46% in Chihuahua to 72% in Coahuila. The remainder of the population, approximately 4.1 million people, either obtained care from the private sector or SSA or they received no care at all. Because relatively few people in Mexico are wealthy and because the middle class generally consists of individuals eligible for IMSS or similar programs by virtue of employment, one can assume that the great majority of the uninsured persons are poor and that their only access to services is through SSA.

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[1] Margaret C. Mendez, Prospects for Cooperative Efforts: A Review of Selected Maternal and Child Health Programs in the United States and Mexico, Working Paper No. 24 (Austin: Lyndon B. Johnson School of Public Affairs, 1983).

Slightly over half of the 1979 population in the border states was eligible for IMSS, the agency which insures private sector workers and their families. In Tamaulipas, only about one-third of the population was IMSS eligible. In Nuevo Leon, almost two-thirds were IMSS eligible. About 6% of the total population was eligible for ISSSTE with a range from 2% in Nuevo Leon to 11% in Tamaulipas and Coahuila. Although 5% of the Tamaulipas population was covered by PEMEX, very few individuals were PEMEX eligible in the other states. The remaining programs covered about 1% of the total population.

Table 7.3 presents eligibility information for IMSS in 1980 and ISSSTE in 1979 in the principal municipios located directly on the border. Of immediate interest is the wide variation among municipios in terms of the percentage of population eligible under the respective programs. In Juarez, an estimated 5% of the population was eligible for ISSSTE services in 1979. However, in Acuna, 16% of the population was eligible. Similarly, only 15% of Rio Bravo's population was eligible for IMSS services in 1980 compared to almost 70 percent in Nogales. In total, an estimated 1 million (40%) of the border municipio residents were eligible for services under one or the other of these two programs. If about 3% of the population was eligible for other programs, as suggested by statewide data, then we can estimate that almost 1.5 million people (57%) in the municipios had no public insurance coverage.

Information was located concerning the age and sex distributions of the ISSSTE eligible population for the six border states.[2] Of the approximately 700,000 eligible persons (excluding pensioners) in 1979, about 7.5% were under age five. However, out of the total 1980 census population, 12.9% were in this age range. Thus, young children appear to be under-represented in the ISSSTE eligible population. On the other hand, women of fertile age (15-44) represented 28.4% (about 200,000) of the eligible population, a figure somewhat higher than the 22.3% for the population as a whole. The fact that pension recipients are excluded from these calculations accentuates the under-representation of children and suggests that women of fertile age are not really over-represented as they may seem. We do not know if this pattern applies to the much larger IMSS program. However, given that IMSS coverage depends on employment and that the poor have larger families, we might guess that children are generally under-represented among the insured.

7.2 Facilities

Because private sector health care is a relatively small part of Mexico's health care system, most individuals not served by social security programs must use SSA services in order to obtain medical care. SSA in 1980 operated three types of health centers and four types of hospitals (table 7.4). These facilities differ in terms of services, staffing and available beds. The size of a community's population generally determines which types of facilities are available.

Table 7.5 lists the facilities identified in the border municipios according to type of facilities and parent institution. Where information was located, the numbers of beds and physicians and other staff are shown. This table is incomplete and several elements are inaccurate, primarily because it was developed as a composite from a variety of sources which occasionally conflicted. Absent from the table are municipal hospitals (hospitales civiles), charity hospitals, and private facilities in most of the municipios, as well as facilities operated by PEMEX and similar institutions. Further, the table contains inaccuracies in terms of beds and staff. For example, some facilities are shown as having certain numbers of beds which, in fact, are available only through agreements with other facilities. Similarly, the table does not account for the fact that many physicians, and possibly other types of staff, are part-time employees and may work at more than one institution. Thus, there is likely to be double-counting in terms of the resources available to the facilities. Because of these problems within the table, information presented should be viewed with some caution.

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[2] Instituto de Seguridad y Servicios Sociales para los Trabajadores del Estado, Anuario Estadistico, 1979, Tomo 1 (Mexico, D.F.).

Several points can be gleaned from table 7.5. First, IMSS clearly has the most significant resources in terms of hospital facilities. However, IMSS does not appear to make substantial use of free-standing clinics and health centers. These may operate as organizational divisions of the hospitals. Second, SSA relies heavily on health centers that often operate in tandem with small hospitals having 8 to 24 beds each. Third, although data on municipal hospitals and other facilities that are independent of the major health care institutions are only available for those municipios located in Tamaulipas, it is clear that these facilities have substantial resources in terms of beds and staff. Finally, the presence of at least four SSA sponsored maternity centers on the border is of particular interest.

In total, 117 facilities were identified. These include six ISSSTE hospitals and seven ISSSTE clinics. Twenty hospitals and eight clinics were identified under IMSS management. Forty-six SSA facilities were identified, including one hospital, four maternity centers, thirty-one health centers, and ten health centers operating in consort with small hospitals. An additional thirty facilities were identified having a total of almost 700 beds. Three of these facilities are under the auspices of the private Centro Materno Infantil y de Planificacion Familiar in Juarez. One of these is a maternity center.

Data were also collected concerning facilities located in the 22 minor municipios situated along the border (table 7.6). Most of these municipios have very small populations. A few with larger populations have urban centers located some distance from the border. In the small municipios, ISSSTE relies on "satellite" services, which are usually provided through contracts with physicians. IMSS operates six hospitals and 12 clinics. SSA has 26 facilities in these municipios. All municipios, however small, have some service available.

7.3 Inpatient Utilization

Table 7.7 presents information concerning inpatient utilization of the IMSS and ISSSTE facilities in the major municipios. ISSSTE admitted 12,000 patients in 1979. IMSS admitted about 90,000 patients in 1980. While ISSSTE facilities reported about 66,000 days of inpatient care, IMSS reported more than 400,000 patient days. Information concerning average stay, bed days, and occupancy rates was located only for ISSSTE hospitals. For IMSS, the average days of stay were calculated by the researchers. Overall, the average stay for

ISSSTE was estimated at 5.2 days. The average for IMSS was 4.6 days. Hospital stays in smaller communities appear to be shorter. Occupancy for ISSSTE hospitals ranged form 34% to 60%.

SSA hospitalization data were located for the entire border strip, including all municipios, large or small, along the border (table 7.8). In 1979, SSA reported 12,000 hospitalizations in the border areas. A year later the number fell below 10,000 and in 1981 only 9,600 hospitalizations were reported. Thus, not only did SSA hospitalizations decline, but in comparison to the other providers SSA makes relatively little use of hospital beds. This finding is consistent with the earlier observation that SSA is more active in clinics, rather than hospitals. Also, it should be noted that SSA clients often use the civil hospitals.

Table 7.9 lists the principal causes of ISSSTE hospital morbidity in 1980 in 11 of the principal border municipios (Rio Bravo is omitted). Rates are calculated on the basis of eligible populations in 1979. The table indicates that birth-related services consume large shares of hospital resources. Sixteen percent of the hospital admissions in the principal border municipios resulted in normal births. The second leading cause of hospital morbidity was "direct obstetrical causes," which accounted for another 5% of the admissions. Normal births were the leading causes of hospitalization in each municipio except Juarez (data not shown), where it was second only to "not specified."[3] The ranking of "poorly defined intestinal infections" as the fifth leading cause of hospitalization suggests relatively poor environmental sanitation.

Table 7.10 provides greater detail concerning ISSSTE hospital utilization associated with childbirth in 1980. A total of 4,185 admissions entailed normal births, obstetrical causes, abortions, births with complications, perinatal causes, or congenital anomalies. This number constituted 28.8 percent of the ISSSTE hospitalizations in the border municipios. Even allowing for the fact that obstetrical events generally require shorter periods of hospital stay, it is clear that substantial portions of ISSSTE resources are used for maternity and associated services.

Table 7.11 organizes information concerning 13,000 discharges from ISSSTE hospitals and extension facilities along the border in 1979. Obstetrical services accounted for 23% of the discharges, gynecological services accounted for 12% and pediatrics constituted 11% of the discharges. The average obstetrical discharge followed 2.9 days of stay, gynecological services required 4.8 days, pediatric services averaged 5.4 days, and other types of services required an average of 6.2 days in the hospital or extension facility. Thus, while obstetrics and gynecology jointly accounted for 34.6% of discharges, their shorter stays accounted for only 23.6% of patient days.

For the six border states, obstetrical and gynecological services accounted for almost 190,000 admissions to IMSS facilities in 1979 (table 7.12). These services required an average of 2.4 days of stay per admission. IMSS recorded 214 deaths in this service area. Nursery services entailed 122,000 hospital admissions and an average of 2.0 days per admission. Sixty-one nursery deaths were recorded. Only 83,000 admissions were for pediatric services. However, the average pediatric stay was 5.5 days. About 2,200 pediatric deaths were recorded. Premature infants resulted in 7,620 admissions with an average of 11.1 days of stay and 1,176 reported deaths.

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[3] Instituto de Seguridad y Servicios Sociales para los Trabajadores del Estado, Contraloria General, Departamento de Estadistica y Actuaria, 1980, unpublished data.

In 1979, ISSSTE recorded 2,808 live births within its facilities located in major border municipios (table 7.13). In 1980, IMSS recorded 29,121 live births. This translates into 14.7 and 34.4 live births per 1,000 eligible population, respectively. The low figure for ISSSTE is of interest. Earlier data showed that women of fertile age were represented among ISSSTE eligibles roughly in proportion to their representation in the general population. Thus, the low rate cannot be easily attributed to the composition of the eligible population. Perhaps the relatively well-educated government workers produce fewer children or some women may be giving birth outside of ISSSTE facilities.

7.4 Outpatient Utilization

In the major border municipios, ISSSTE was responsible for almost 600,000 outpatient visits in 1979 (table 7.14). Of the total ISSSTE visits, 4.9% entailed services to infants, 10.4% to children ages 1-4, and 15.5% to children ages 5-14.[4] IMSS provided for almost 2.9 million outpatient visits in 1980. Despite the fact that SSA is responsible for a much larger population, the agency recorded only 276,000 outpatient visits in 1980 throughout the border areas of the six northern states (table 7.15). However, by 1981 this number more than doubled to 576,000 outpatient visits, indicating that SSA had substantially increased its capacity to serve its target population. This increase in outpatient services by SSA corresponds to a simultaneous decrease in inpatient care.

Mexico's government is implementing an aggressive national program encouraging the practice of family planning. While local data are not available, in 1979 ISSSTE recruited 10,100 new participants into its family planning programs in the six border states.[5] IMSS recruited 138,000 new participants which added to its already active caseload of 287,000 family planning participants.[6] In the border areas of the six northern states, SSA counted the delivery of 64,000 planning services in 1979 and almost 88,000 in 1981 (table 7.16). About half of the new ISSSTE and IMSS participants preferred hormonal methods of contraception. The use of the IUD and surgery were also common.

Information is provided in table 7.17 about immunizations applied by IMSS, ISSSTE, and SSA in the six border states. In most cases, the largest numbers of immunizations were applied by IMSS. SSA also immunized large numbers. SSA immunizations for measles, polio, tuberculosis, and diptheria-pertussis-tetanus (DPT) decreased between 1980 and 1981. ISSSTE immunizations for measles and tuberculosis increased between 1979 and 1980.

Table 7.18 provides information about SSA's communicable disease control efforts in border areas of Mexico's six northern states. The number of immunizations increased from 427,000 to 897,000 between 1979 and 1981. Counts of activities related to disease control increased from 48,000 to 290,000 and disease detection activities increased from 33,000 to 51,000 over the same time period.

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[4] Instituto de Seguridad y Servicios Sociales para los Trabajadores del Estado, Anuario Estadistico, 1979, Tomo 1 (Mexico, D.F.).

[5] Ibid.

[6] Instituto Mexicano de Seguro Social (IMSS), Anuario Estadistico de Servicios Medicos, 1979 (Mexico, D.F.).

IMSS has published figures on immunization coverage rates among its clients under 1 year of age (table 7.19). Between 42% and 55% of eligible infants, depending on the state, received DPT immunizations in 1979. Similar coverage was obtained for Sabin polio immunizations. Coverage for tuberculosis (BCG) ranged from 85% to 116% in the respective states. The figures of over 100% were achieved by the immunizations of infants who were not otherwise eligible for IMSS health care services. The provision of immunization services to ineligible infants suggests that the other coverage figures may be overstated.

Table 7.20 provides information about some other SSA services in the border areas of the six northern states. The agency reported 1.7 million instances of nutrition service in 1979. This number increased to 2.4 million in 1981. About 28,400 counts of activities in 1979 were described as "public capacity building." This figure increased to 46,200 in 1981. SSA reported 71,500 units of sanitation and environmental service in 1979, decreasing to about 58,200 in 1981.

7.5 Health Care Financing

SSA has published budgetary data concerning its activities in border areas within the six northern states (table 7.21). The budget figures are presented in United States dollars calculated at an exchange rate of 25 pesos to the dollar. The overall budget almost doubled from $12.9 million in 1979 to $24.8 million in 1981. Most of the increase took place between 1980 and 1981, a time when inflation increased in Mexico.

More than two-thirds of the totals are shown as "other programs." Among those activities for which itemized data are available, the largest amount was for outpatient health care which, in 1981, accounted for 15.2% of the total. Inpatient care constituted 7.1% of the total. The budgets for outpatient and inpatient services increased substantially between 1979 and 1980 and stabilized between 1980 and 1981. In each year, about twice the funds were budgeted for outpatient care as for inpatient care. The remaining itemized activities, ranked by their respective allocations, were environmental sanitation services, immunizations, family planning, disease control, disease detection, nutrition, and public capacity building. The budgets for each of these activities, except capacity building, increased substantially between 1979 and 1980. The amount for the "other" activities increased substantially between 1980 and 1981. In each year, more than three times as much money was budgeted for curative services as for preventive care.

Table 7.22 documents expenditures by IMSS in the six border states in 1979. In this table the exchange rate is calculated at 22.5 pesos to the dollar. In Mexico as a whole, IMSS spent $1.84 billion (U.S.) for health and maternity care. The six states on the northern border accounted for $409 million or 22.3% of the total. This was a relatively large share of the total because, according to Mexico's 1980 census, only 15.7% of Mexico's population lived in those border states.

Table 7.23 shows the expenditures in 1978 by the different institutions active in health care in Mexico. Expenditures are categorized according to preventive care, curative care, sanitation, and health administration. Excluded are social security activities, loans for social welfare and research, as well as certain other activities that are not directly related to health care. The health administration item should be viewed with caution because such figures are rarely comparable between agencies. This may be the case in table 7.23 because SSA reports substantial expenditures for administration and the remaining agencies report little or no administrative costs. On the other hand, SSA as the national health ministry has substantial administrative responsibilities.

Of greater relevance are the respective expenditures for the different types of services and the overall differences in expenditures between agencies. Sixty-one percent of the total was spent by IMSS, 23% by SSA, and about 12% by ISSSTE. Less than 5% of the overall health expenditure was for prevention and more than 80% was for treatment. The ratio of curative to preventive care expenditures for SSA was 4.7 to 1; for IMSS, it was 45 to 1; for ISSSTE, it was 8 to 1; and for the other institutions, it was 146 to 1. Although the IMSS commitment to preventive care is proportionately small, the size of the agency's budget makes its preventive care expenditure equal to that of ISSSTE.

Expenditures for health constituted 4.15% of Mexico's gross national product (GNP) in 1977.[7] Almost 60% of that amount was spent by SSA, IMSS or ISSSTE. Between 1967 and 1977, IMSS and SSA expenditures increased as a percent of GNP (table 7.24). ISSSTE expenditures declined as a percent of GNP.

In terms of per capita expenditures, in 1979 IMSS spent 2,081 pesos (about $92) for each of its eligibles. ISSSTE spent 1,243 pesos ($55) and SSA spent 337 pesos ($15). From 1977 to 1979, IMSS increased its per capita expenditure by 31% ISSSTE by 61%, and SSA by 48%.

7.6 Human Resources Development

In 1977, 15 schools were training medical students within the six Mexican border states (table 7.25). Their total enrollment was just under 13,000 students, of which 4,700 were in the entering class. In 1976, there were 33 schools training nurses in the border states with a total of 4,900 students.

SSA, through its Division of Maternal and Child Health and Family Planning, has been training lay midwives in an effort to extend the availability of health services. At the end of 1981, a total of 365 lay midwives had completed training in Mexico's six border states. Of these, 27 were qualified as instructors.

7.7 National Prevalence Survey

In 1979, the Mexican government conducted a nationwide survey on use of contraceptives, fertility, and maternal and infant health care.[8] The National Prevalence Survey included two samples and two separate questionnaires, one on prevalence of contraceptive use and another on maternal and infant care. Mexico's six northern border states were over-sampled, a decision that enabled the subsequent analysis of the results for those states and also the border municipios as a group on the basis of sampling in eight of the municipios.[9] The survey, while quite comprehensive, has some limitations, where the small size of the sample on the border limits statistical interpretation when results are disaggregated by age or other groups. In this summary of that data, results are presented for the border although in some cases the small sample results in wide variation in the numbers. The state level data are also presented where results appear to differ, and some national level results are shown for comparison. No statistical analysis is attempted. The U.S. government conducted a similar survey in 1979 covering 51 U.S. counties on or near the border. Some data from that survey are presented here for comparison.

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[7] Daniel Lopez-Acuna, La Salud Desigual de Mexico, 1981.

Of the 2,032 women ages 15-44 surveyed in border municipios, 1,467 answered questions related to contraceptive use and 565 gave information on maternal and infant care (table 7.26). About 60% of the respondents in the border states were married. Less than 5 percent were single, never married. The married women surveyed in the border municipios were slightly younger as a group than were the married respondents in the border states. Only 22% of the married respondents in the municipios had any high school education.

The currently married women surveyed in the border municipios had a history of greater fertility compared to the ever-married women (not an entirely comparable group) surveyed in the counties (table 7.27). For each age group, the women in the municipios had more live births than did Mexican-American women in the counties, who in turn had more live births than Anglo women in the counties. We should note that the source document shows highly significant statistical differences for each age group, except 15-19, between the Mexican-Americans and the Anglos.

7.7.1 Contraceptive Use

Single, never-married women in Mexico rarely reported use of contraceptives, either current or former use (table 7.28). By comparison, never-married Mexican-American women reported current use about half as often as Anglo women, but a great deal more often than Mexican women.

Among currently married women, the pattern is similar. About half of the married Mexican women reported current use of contraceptives, compared to about two-thirds of the Mexican-Americans and three-quarters of the Anglos. Of the married women, about 30% of the Mexicans reported never having used contraceptives. About 10% of the Mexican-Americans so reported, as did less than 2% of the Anglos. While these results might be thought to reflect the younger ages of the married women from Mexico, closer inspection by age groups shows that such is not the case. For each age group, the women from Mexico less frequently reported current use of contraceptives than did Mexican-American or Anglo women. The source document indicates that statistical analysis reveals significant differences between Mexican-Americans and Anglos only for the 35-39 and 40-44 age groups. For each age group, the married women in the border municipios reported current use of contraceptives more frequently than did women from the Mexican border states. However, it is not clear that statistical testing would authenticate those differences.

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[8] J.M. Manautou, et al., Fecundidad. Uso de Metodos Anticonceptivos y Atencion Materna en la Zona Fronteriza Mexico - Estados Unidos, (Mexico, D.F.: IMSS, Jefatura de Servicios de Planificacion Familiar, 1981).

[9] J.C. Smith, C.W. Warren, and J. Garcia-Nunez, The U.S.-Mexico Border: Contraceptive Use and Maternal Health Care in Perspective, 1979, (El Paso: United States-Mexico Border Health Association, 1983).

In the municipios, the pill is the most common form of contraceptive (table 7.29), and is used by about half of the married women who practice contraception. Sterilization, the second most common practice, is much more likely to be used by married women in Mexico (among those who practice contraception) in comparison to Mexican-Americans in the U.S. counties. While the use of IUDs or taking of injections are fairly common, condoms are not widely used.

Of the single or ever-married women in the municipios who discontinued contraceptive practice, about 60% cited pregnancy or related reasons (desired pregnancy or post-partum lactation) for discontinuance. The experience or fear of side effects was cited by about 12% of those who discontinued. Opposition of husband (or mate) was rarely given as a reason for discontinuing contraceptive practice.

The sources of contraceptives differed depending on the type of contraceptive (table 7.30). Respondents indicated that pills, injections, and condoms were usually obtained in the private sector, most frequently from a pharmacy. IUDs and sterilization were most often obtained in the public sector. IMSS accounted for more than 40% of sterilizations, 36% of IUDs, and 12% of pills. SSA accounted for one-third of IUDs and 12% of pills, but few of the sterilizations. While ISSSTE accounted for about 14% of sterilizations, they had relatively small "market shares" for pills and IUDs.

7.7.2 Maternal and Infant Care

About 10% of the married women in the border municipios reported having no prenatal care during their last pregnancy (table 7.31). This figure is high compared to the United States, where prenatal care was not obtained or documented (prenatal care unknown) for 4% of births in 1980. However, the 10% in the municipios is low compared to 13% for Mexico's border states and almost 20% nationally.

The numbers, disaggregated by age, are unstable for the municipios because of small sample size. However, data for the border states indicate that failure to obtain prenatal care is most common among older women (ages 30+). Disaggregation by mothers' education shows that lack of prenatal care rarely occurs among the educated and almost entirely occurs among the uneducated or minimally educated. It is not clear whether failure to obtain prenatal care stems directly from lack of education, or whether it is a consequence of limited employment opportunity which results in lack of insurance coverage.

Of those married women who obtained prenatal care in the municipios, about two-thirds reported receiving care in their first trimester of pregnancy (table 7.32). This figure is comparable to the U.S. national figure of 77% for 1980 (disregarding marital status or mothers' ages). About 8% of married women in the municipios obtained such care in the third trimester compared to 4% for the U.S. Failure to obtain early prenatal care may relate to mother's age, where the youngest and oldest age groups have the greatest problems. However, any such age effect, if it exists, is clearly overshadowed by the education relationship. The most educated women almost always obtained care in the first trimester.

In the municipios, married women ages 15-44 who obtained care during childbirth went to the public sector a little more than half of the time (table 7.33). IMSS, among public agencies, was mentioned most often, followed by SSA. Private physicians accounted for almost one-third of the care in the municipios, and somewhat less in the more stable state-level data.

About 10% of women in the border municipios and states reported traditional midwives or healers as their source of birthing care. It is not known whether the activities of parteras on the U.S. side of the border influence these data. However, the use of traditional midwives and healers on the border is nothing compared to Mexico as a whole where more than a quarter of all births are attended by these individuals.

Use of traditional midwives and healers is more common among older and less educated women (table 7.34), and appears to be rarely used by younger or more educated women. However, married women ages 15-44 are less likely to use traditional providers in comparison to all women ages 15-44, suggesting that use of traditional birth attendants is very high among unmarried women. The reader is reminded that women in consensual union are considered as married in these data.

Younger married women appear more likely to give birth under public sector care, and older women under private sector care. The uneducated more commonly use the public sector, while the educated use the private sector.

Among married women ages 15-44 in the municipios who had given birth, about half received post-partum care (table 7.35). This figure is somewhat higher than that for the border states, which is higher again than the national figure. There appears to be little, if any, age relationship. However, education is clearly a factor in obtainment of post-partum care.

In the municipios, the outcome of the last pregnancy among married women ages 15-44 was a live birth in about 95% of cases (table 7.36). Stillbirth or abortion as outcomes were somewhat less commonly reported at the municipio level than at the national level. Abortion (spontaneous or induced) appears to be age related. Older women more frequently reported abortion as the outcome of their last pregnancy. No comparable data were found for unmarried women.

About a quarter of the married women ages 15-44 reported having had an abortion at some time (table 7.37). The data do not differentiate between spontaneous or induced abortions. More than half of the least educated women in the municipios reported a prior abortion. This figure is twice the national figure of 25% for this group. In the municipios, the figures decline for each higher educated group until the most educated group where it jumps to 30%. These findings are also evident in the data for the border states (not shown), but not in the national figures. Of those women with a prior abortion, about two-thirds in the municipios reported receiving care compared to three-quarters at the national level. Of those receiving care in the municipios, about 70% reported private physicians or paramedics as their source of care. At the national level, the figure was closer to 33%. In the municipios, the rest of the women obtained care in the public sector. Nationally, about 7% of the women obtained care from traditional midwives and non-medical personnel.

In the municipios, about 60% of women, regardless of marital status, breast-fed their last child (table 7.38). The figure was 65% for the states and more than 75% for the nation. Not only was proximity to the border a factor in failure to breast-feed, it also resulted in shorter average length of time for breast-feeding among those who did so. Generally, in the municipios and the border states, the youngest and oldest women were more likely to breast-feed their infants. This relationship may result from the demands of employment on the women in the middle age ranges. While breast-feeding is now more fashionable in the United States than a generation ago, the reader should note that modernization in Mexico lures women away from tradition and that, given inadequate income for pasteurized milk or poor hygienic conditions, the trend toward bottle feeding may present some risks to infants. Breast-feeding is also important in bonding for mother-child relationships and in transmission of some disease immunity to the infant.

7.8 Summary

Mexico's health care system is dominated by public sector programs. The major providers include IMSS, ISSSTE, SSA, and PEMEX. As a whole, Mexico's health care system lacks sufficient resources to meet the needs of the population.

About 40% of the population in the border municipios was eligible for health care services provided by IMSS or ISSSTE. Most of the remaining population relies on indigent care provided by SSA. The two employment-related health programs (IMSS and ISSSTE) rely primarily on hospitals to deliver their health services. SSA makes more extensive use of health centers. Some public services are available in each municipio, no matter how small or remote. Large shares of public health care resources are invested in maternity and birth-related care.

The three major public providers conduct substantial outpatient service activities. Between 1979 and 1981, SSA appears to have doubled such activity while simultaneously reducing inpatient admissions. Mexico is aggressive in its family planning strategy, an effort which has substantially reduced fertility over the last decade. SSA, for example, increased family planning services in the border areas of Mexico's northern states by more than one-third between 1979 and 1981. All three agencies provide immunizations. SSA doubled the number of its immunizations on the border from 1979 to 1981. While IMSS also provides large numbers of immunizations, coverage rates in the border states hover around 50% for DPT and Sabin (polio) among their eligible infants. SSA reports substantial activity in nutrition services, but less in the area of environmental sanitation.

Prior to the devaluation of the peso, SSA budgeted about $25 million (U.S.) for the border in 1981. This figure, at a constant rate of exchange, doubled from 1979. About 6.5% went to preventive health care, 15% to outpatient curative care, and 7% to hospitalization. IMSS spent about $400 million (U.S.) in the six border states in 1979. For Mexico as a whole, IMSS dominated public sector spending for health care but, in comparison to SSA and ISSSTE, spent proportionately less on preventive care. The three agencies combined increased their budgets as a percent of gross national product between 1967 and 1977. Their budgets each have increased in terms of per capita spending among eligible persons.

In the six border states, medical students far outnumbered nursing students, a finding which suggests that training resources could be more appropriately distributed in view of the public's health needs.

By most measures of contraceptive use, fertility, and access to maternity and related services, women in Mexico's border communities fare much better than women in the interior. However, their problems are greater than among women on this side of the border, and much greater than among women in the U.S. as a whole. Contraceptive practice is low, especially among single women. Substantial numbers obtain no prenatal care or obtain care late in pregnancy. Compared to women in the U.S., women on Mexico's border make frequent use of traditional midwives. However, such use is not nearly as extensive as in Mexico's interior. The use of private physicians as birth attendants is common, a surprising finding in view of the dominance of public sector health care. Only half of married women received post-partum care.

While age appears to be a factor in use or non-use of health care on the border, education is the dominant predictor. The least educated women, who in Mexico are numerous, generally are least likely to obtain health care for maternity or related reasons. When they do obtain care, their source of care is more likely to be non-medical in nature. The most educated women, who are few in number, have patterns of health care access not so different from U.S. middle-class women.

TABLE 7.1

MAJOR HEALTH CARE PROVIDERS IN MEXICO, CAPACITY TO CARE FOR MEXICO'S POPULATION, 1978

Institution	Target Population	% Need Served
Instituto de Seguridad y Servicios Sociales para los Trabajadores del Estado (ISSSTE)	Government workers	3.9
Instituto Mexicano de Seguro Social (IMSS)	Private sector workers	18.1
Servicios Coordinados de Salud Pública en los Estados (SSA)	Public health services for general population; health care for the poor	12.9
Petróleos Mexicanos (PEMEX), Ferrocarriles Nacionales, Seguro Social para las Fuerzas Armadas, etc.	Petroleum, railroad workers, military, etc.	7.5
Private Health Care	Private pay	12.3
	Need Addressed	54.7
	Unmet Need	45.3
	Total	100%

Sources: COPLAMAR, Necesidades Esenciales en Mexico, Salud 1982, Mexico, D.F.
Margaret C. Mendez, Prospects for Cooperative Efforts: A Review of Selected Maternal and Child Health Programs in the United States and Mexico, Working Paper No. 24 (Austin: Lyndon B. Johnson School of Public Affairs, 1983).

TABLE 7.2

ELIGIBLE POPULATIONS OF SOCIAL SECURITY INSTITUTIONS AND PERCENTAGE OF TOTAL POPULATION IN MEXICO's NORTHERN STATES, 1979

(x1000)

	IMSS		ISSSTE		PEMEX		Others		Total Eligible		Total Population*	
	#	%	#	%	#	%	#	%	#	%	#	%
Tamaulipas	634	34	198	11	98	5	28	1	958	51	1,880.1	100
Nuevo León	1,567	66	48	2	7	<1	40	2	1,662	70	2,389.5	100
Coahuila	891	59	165	11	2	<1	34	2	1,093	72	1,514	100
Chihuahua	753	40	87	5	2	<1	28	1	870	46	1,903.4	100
Sonora 863	59	70	5	--	--	36	2	968	66	1,460.3	100	
Baja California Norte	622	52	73	6	--	--	10	1	705	59	1,191.7	100
Total Six States	5,330	52	641	6	109	1	176	2	6,256	61	10,339.8	100

Sources: Censo de México, 1970 and 1980.
Secretaría de Programación y Presupuesto, Cuaderno de Información Oportuna del Sector Salud 2, 1981 (Mexico, D.F.).

* 1979 estimate of population determined by straight-line interpolation between 1970 and 1980 censuses.

TABLE 7.3

POPULATIONS INSURED BY ISSSTE AND IMSS IN THE PRINCIPAL BORDER MUNICIPIOS

	ISSSTE - 1979		IMSS - 1980		Total
Municipios	Workers and Family Members	Percent 1979 Population[A]	Enrolled with Facilities	Percent 1980 Population	Percent of Population[B]
Matamoros	19,761	8.5	71,990	30.1	38.6
Río Bravo	8,790	10.7	12,273	14.7	25.4
Reynosa	21,821	10.6	50,192	23.7	34.3
Nuevo Laredo	18,581	9.4	52,063	25.6	35.0
Piedras Negras	10,453	13.6	43,599	35.7	50.1
Acuña	6,563	16.0	C	C	C
Juarez	27,846	5.0	209,774	37.0	42.0
Agua Prieta	2,523	7.6	15,788	45.9	53.5
Nogales	8,433	12.7	46,648	68.5	81.2
San Luís Río Col.	7,251	8.1	18,462	19.9	28.0
Mexicali	30,277	6.1	174,046	34.1	40.2
Tijuana	28,155	6.3	133,461	28.9	35.2
Total 12 Municipios	190,454	7.5	828,296	32.0	39.5

Sources: Censo de México, 1970 and 1980.
Instituto Mexicano de Seguro Social (IMSS), Anuario Estadístico de Servicios Médicos, 1980 (Mexico, D.F.).
Insituto de Seguridad y Servicios Sociales para los Trabajadores del Estado (ISSSTE), Anuario Estadístico, 1979, Tomo 1 (Mexico, D.F.).

A. Based on straight-line interpolation between 1970 and 1980 census reports.
B. Sum of percents for ISSSTE and IMSS.
C. Included with Piedras Negras.

TABLE 7.4

DEFINITIONS OF SSA FACILITIES

Health Center "A" - Generally located in state capitals and localities of 20,000 or more inhabitants

- Regularly provide all specialized services
- Usually have no beds

Health Center "B" - Located in localities of 2,500 to 20,000 persons

- Provide preventive and curative medical services
- Provide outpatient, emergency, and hospitalization services
- May have 8 to 28 beds

Health Center "C" - Located in localities of less than 2,500 persons

- Provide preventive service, general consultation and prenatal and postnatal care. Generally staffed by a "pasante" (recent medical graduate in national service) and auxilliary nurses
- Generally have three to eight beds

Hospital "A"	- 100 or more beds
Hospital "B"	- 50 to 99 beds
Hospital "C"	- 25 to 49 beds
Hospital "D"	- 8 to 24 beds

Source: Secretaría de Salubridad y Asistencia (SSA), "Servicios Coordinados de Salud Pública en los Estados," 1981, unpublished.

TABLE 7.5

HEALTH FACILITIES AND HUMAN RESOURCES IN PRINCIPAL BORDER MUNICIPIOS, 1980

Muncipio Institution	Type of Facility	Beds	Physicians	Nurses	Other Personnel[1]
Matamoros					
ISSSTE	Clinical Hosp.	39	46	66	118
	Clinic	--	23	19	--
IMSS[2]	Hospital	125	107	--	408
	Clinic	--	1	--	1
SSA	Center A	78	39	63	--
	Ctr B/Hosp D (3)	*	*	*	--
	Center D (9)	*	*	*	--
	Center C (3)	--	3	3	--
Municipio	Civil Hospital	122	26	57	--
	Dispensary				
Others	Nine facilities	96	10	28	--
Río Bravo					
ISSSTE	Clinic	0	6	6	21
IMSS	Hospital	10	12	-	29
	Clinic	0	3	-	3
SSA	Ctr B/Hosp D	15	4	10	-
	Center C	*	*	*	-
Others	Two facilities	24	4	9	-
Reynosa					
ISSSTE	Clinical Hosp.	52	63	70	130
IMSS	Hospital	100	93	-	322
SSA	Ctr A/Hosp D	12	12	24	-
Municipio	Civil Hospital	42	8	20	-
Others	Nine facilities	184	69	86	-
Nuevo Laredo					
ISSSTE	Clinical Hosp.	52	48	82	109
IMSS	Hospital	90	93	-	284
SSA	Center A	-	34	28	57
Municipio	Civil Hospital	138	21	23	-
Others	Three facilities	65	2	23	-
Piedras Negras					
ISSSTE	Clinic	0	15	6	28
IMSS[3]	Hospital	124	61	-	308
SSA	Maternity Center A	10	14	24	45

TABLE 7.5 (Cont.)

Muncipio Institution	Facility	Beds	Physicians	Nurses	Other Personnel[1]
Acuña					
ISSSTE	Clinic	0	8	4	17
IMSS	Hospital	21	28	-	101
SSA	Center B/Hospital D	9	8	13	16
Juárez					
ISSSTE	Clinical Hosp.	62	80	89	136
IMSS	Hospital	269	242	-	833
	Hospital	164	41	-	484
	Clinic	0	24	-	70
SSA	Center A	-	22	41	97
	Center B	-	12	9	17
	Center C (5)	0	4	3	1
	Maternity Ctr C	6	5	11	10
MIPFAC[4]	Clinics (3)	-	5	12	12
Agua Prieta					
ISSSTE	Clinic	0	2	2	4
IMSS	Hospital	6	9	-	20
SSA	Maternity Center A	0	6	9	18
Nogales					
ISSSTE	Clinic	0	-	-	-
IMSS	Hospital	100	67	-	268
SSA	Maternity Center A	28	28	52	55
	Center B/Hospital D	19	16	18	17
San Luís R.C.					
ISSSTE	Clinic	0	5	2	11
IMSS	Hospital	31	20	-	75
	Hospital	9	4	-	1
SSA	Center B/Hospital D	19	16	18	19

TABLE 7.5 (Cont.)

Muncipio Institution	Type of Facility	Beds	Physicians	Nurses	Other Personnel[1]
Mexicali					
ISSSTE	Clinical Hospital	94	77	109	95
IMSS	Hospital	320	296	--	752
	Hospital	9	5	--	13
	Hospital	8	4	--	13
	Hospital	8	3	--	11
	Hospital	9	6	--	15
	Hospital	9	6	--	13
	Hospital	8	4	--	13
	Clinic	0	26	--	68
SSA	Center A	0	105	35	41
	Center B/Hospital D	12	11	4	3
	Center B/Hospital D	12	14	8	1
	Center C	24	22	16	1
Tijuana					
ISSSTE	Clinical Hospital	65	79	65	112
IMSS	Hospital	168	145	--	466
	Clinics (4)	0	55	--	117
SSA	Center A (2)	0	29	19	67
	Hospital A	99	53	80	127

Sources: IMSS, Anuario Estadistíco de Servicios Médicos (Mexico, D.F., 1979 and 1980).
ISSSTE, Contraloría General, Departamento de Estadística y Actuaria, unpublished data.
ISSSTE, Anuario Estadístico, 1979, Tomo 1 (Mexico, D.F.).
SSA, Servicios Coordinados de Salud Pública en los Estados, 1980, unpublished data.
SSA, Servicios Coordinados de Salud Pública en el Estado de Tamaulipas, 1980, unpublished data.

Notes: Dashes (--) indicate unknowns. Information concerning local civil hospitals in some municipios and other facilities is not shown.

1. May include nurses where not shown separately.
2. Alternative source shows IMSS hospital and clinical hospital jointly having 58 beds, 51 physicians, and 63 nurses.
3. Data for 1978.
4. Centro Materno Infantil y de Planificación Familiar.

* Data are included in line above.

TABLE 7.6

HEALTH FACILITIES IN MINOR BORDER MUNICIPIOS, 1980

Municipio	Institution	Facility	Beds	Physicians	Other Personnel
Tamaulipas					
Díaz Ordaz	ISSSTE	Satellite Service	--	1	--
	IMSS	Clinic	--	3	3
	SSA	Center B	7	4	5
Camargo	ISSSTE	Satellite Service	--	1	--
	IMSS	Clinic	--	3	5
	SSA	Center B/Hospital D	13	7	16
		Center C	3	2	1
Miguel Alemán	ISSSTE	Satellite Service	--	1	--
	IMSS	Clinic	5	6	12
	SSA	Center B	3	3	8
	Others	Four Facilities	34	7	13
Mier	ISSSTE	Satellite Service	--	1	--
	IMSS	Clinic	--	--	--
	SSA	Center C	3	1	1
Guerrero	ISSSTE	Satellite Service	--	1	--
	SSA	Center B	3	1	1
Nuevo León					
Anáhuac	ISSSTE	Satellite Service	--	--	--
Coahuila					
Hidalgo	SSA	Center C	--	1	--
Guerrero	SSA	Center C	--	1	--
Jiménez	SSA	Center C	--	1	1
Ocampo	ISSSTE	Satellite Service	--	1	--
	IMSS	Clinic (2)	--	--	6*
	SSA	Center C	--	1	2

TABLE 7.6 (Cont.)

Municipio	Institution	Facility	Beds	Physicians	Other Personnel
Chihuahua					
Ojinaga	ISSSTE	Satellite Service	-	1	-
	IMSS	Hospital	8	6	27
	SSA	Center B	4	5	28
Guerrero	ISSSTE	Satellite Service	-	1	-
	IMSS	Hospital	6	6	14
		Clinic	-	-	-
	SSA	Center C	3	1	-
Guadalupe	ISSSTE	Satellite Service	-	1	-
	IMSS	Clinic	-	-	-
	SSA	Center C	4	1	-
Ascensión	ISSSTE	Satellite Service	-	1	-
	IMSS	Clinic	-	-	-
	SSA	Center C	3	1	1
Jiménez	IMSS	Hospital	8	5	12
Janos	SSA	Center C	3	1	1
Sonora					
Naco	ISSSTE	Satellite Service	-	1	-
	SSA	Center C (3)	9	3	3
Cananea	ISSSTE	Clinic	54	1	4
	SSA	Center B/Hosp D	13	7	32
Saric	SSA	Center C (2)	6	1	1
Altar	IMSS	Clinic	-	-	4
	SSA	Center C	3	1	1
Caborca	ISSSTE	Satellite Service	-	1	-
	IMSS	Hospital	23	26	75
		Clinic	-	2	4
	SSA	Center B/Hosp D	29	10	16
Puerto Peñasco	ISSSTE	Satellite Service	-	1	-
	IMSS	Hospital	4	6	12
	SSA	Center B/Hosp D	16	5	18
		Center C	3	1	1
Baja California Norte					
Tecate	ISSSTE	Satellite Service	-	1	-
	IMSS	Hospital	9	7	18
	SSA	Center B/Hosp D	20	7	51

Sources: IMSS, Anuario Estadístico de Servicios Médicos, 1980 (Mexico, D.F.).
ISSSTE, Contraloría General, Departamento de Estadística y Actuaria, 1980, unpublished data.
SSA, Servicios Coordinados de Salud Pública en los Estados, 1980, unpublished data.
SSA, Servicios Coordinados de Salud Pública en el Estado de Tamaulipas, 1980, unpublished data.

* Data for 1978.

TABLE 7.7

HOSPITALIZATIONS IN MAJOR MUNICIPIOS
(1979 for ISSSTE, 1980 for IMSS)

Muncipio	Institution	Admissions	Patient Days	Average Stay (Days)	Bed Days	Percent Occupancy
Matamoros	ISSSTE	1,621	7,829	4.8	14,235	55.0
	IMSS	9,190	39,466	4.3	--	--
Río Bravo	IMSS	727	1,162	1.6	--	--
Reynosa	ISSSTE	1,559	11,478	7.3	18,980	60.5
	IMSS	6,318	26,965	4.3	--	--
Nuevo Laredo	ISSSTE	1,107	5,246	3.9	15,300	34.3
	IMSS	5,570	27,450	4.9	--	--
Piedras Negras	ISSSTE	785*	--	--	--	--
	IMSS	--	--	--	--	--
Acuña	ISSSTE	422*	--	--	--	--
	IMSS	2,065	6,365	3.1	--	--
Juárez	ISSSTE	2,200	15,074	6.2	29,930	50.4
	IMSS	23,277	107,788	4.6	--	--
Agua Prieta	IMSS	749	1,783	2.4	--	--

TABLE 7.7 (Cont.)

Muncipio	Institution	Admissions	Patient Days	Average Stay (Days)	Bed Days	Percent Occupancy
Nogales	IMSS	5,937	25,545	4.3	--	--
San Luís RC	IMSS	2,390	7,891	3.3	--	--
Mexicali	ISSSTE	2,993	17,788	4.2	34,131	52.1
	IMSS	21,421	110,466	5.2	--	--
Tijuana	ISSSTE	1,316	8,305	5.3	21,900	37.9
	IMSS	12,077	56,397	4.7	--	--
Total	ISSSTE	12,003	65,720	5.2	134,476	
	IMSS	89,721	411,278	4.6	--	--

Sources: IMSS, Anaurio Estadístico de Servicios Médicos, 1980.
ISSSTE, Anuario Estadístico, 1979, Tomo 1.

Notes: Average stay for IMSS is calculated by dividing patient days by admissions. The summary average for ISSSTE is calculated as a weighted average of municipio averages provided by the source. The data do not include inpatient stays at some ISSSTE hospital extension facilities.

* Number of discharges. Included in total but not used in estimate of average length of stay.

TABLE 7.8

SSA HOSPITALIZATIONS IN BORDER AREAS OF MEXICO'S NORTHERN STATES

	Year		
State	1979	1980	1981
Tamaulipas	918	918	693
Nuevo León	70	82	1,096
Coahuila	1,624	1,612	1,863
Chihuahua	1,257	1,264	1,264
Sonora	1,578	2,105	1,372
Baja California Norte	6,588	3,863	3,297
Total Six States	12,035	9,844	9,585

Source: SSA, Dirección General de Servicios Coordinados de Salud Pública en los Estados, "Autoevaluación del Programa Nacional de Desarrollo de las Franjas Fronterizas y Zonas Libres," unpublished report.

TABLE 7.9

PRINCIPAL CAUSES OF ISSSTE HOSPITAL MORBIDITY IN 1980 AND RATE PER 1,000 ELIGIBLE POPULATION IN 1979 (FOR 11 BORDER MUNICIPIOS WITH FACILITIES)

Cause		Hospital Stays	Per 1,000 Eligible	Percent of Stays	Rank
B 41.x	Normal Birth	2,316	12.2	16.0	1
B 39.x	Direct Obstetrical Causes	726	3.8	5.0	2
B -	Not Specified	682	3.6	4.7	3
B 31.5	Hypertrophy of Tonsils & Adenoids	449	2.4	3.1	4
B 01.6	Poorly Defined Intestinal Infections	416	2.2	2.9	5
B 38.x	Abortion	390	2.0	2.7	6
B 34.3	Hernia of Abdominal Cavity	353	1.9	2.4	7
B 18.1	Diabetes Mellitus	352	1.8	2.4	8
B 32.3	Bronchitis, Emphysema, Asthma	328	1.7	2.3	9
BV 00.x	Other Reasons for Contact	287	1.5	2.0	10
B 34.8	Cholelithiasis & Cholecystitis	266	1.4	1.8	11
B 32.1	Pneumonia	261	1.4	1.8	12
B 36.2	Redundant Prepuce and Phimosis	256	1.3	1.8	13
B 34.x	Other Diseases of the Digestive System	252	1.3	1.7	14
B 34.2	Appendicitis	217	1.1	1.5	15
B 37.x	Diseases of the Female Genital Organs	187	1.0	1.3	16
B 39.0	Hemorrhage of Pregnancy and Childbirth	185	1.0	1.3	17
B 26.x	Hypertensive Disease	169	0.9	1.2	18
B 47.2	Fracture of Humerus, Radius and Ulna	166	0.9	1.1	19
B 23.x	Disorders of the Eye and Adnexa	157	0.8	1.1	20
	All Others	6,104	32.0	42.0	--
Total		14,519	76.2	100	--

Sources: ISSSTE, Anuario Estadístico, 1979, Tomo 1 (Mexico, D.F.).
ISSSTE, Contraloría General, Departamento de Estadística y Actuaria, 1980, unpublished data.

TABLE 7.10

BIRTHING RELATED CAUSES OF ISSSTE HOSPITAL MORBIDITY, ELEVEN BORDER MUNICIPIOS, 1980

	Cause							
Muncipios	B41	B39x	B38x	B39	B45	B44	Total	Percentage of Admissions
Matamoros	265	99	41	29	49	6	489	31.7
Reynosa	288	153	46	82	133	22	724	40.9
Nuevo Laredo	163	99	58	35	28	18	401	23.8
Piedras Negras	101	40	20	11	3	6	181	26.6
Acuña	72	23	14	5	1	-	115	27.9
Juárez	199	61	58	22	12	19	371	19.3
Agua Prieta	28	1	1	3	1	-	34	36.6
Nogales	103	12	18	11	1	4	149	26.1
San Luís Río Col.	82	10	8	8	-	-	108	31.7
Mexicali	652	125	92	62	7	36	974	30.8
Tijuana	363	103	34	52	35	52	639	27.3
Total 11 Municipios	2,316	726	390	320	270	163	4,185	28.8

Source: ISSSTE, Contraloría General, Departamento de Estadística y Actuaria, 1980, unpublished data.

Notes:

B41	Normal Birth
B39x	Direct Obstetrical Causes
B38x	Abortion
B39	Births with Complications
B45	Certain Perinatal Causes
B44	Congenital Anomalies

TABLE 7.11

DISCHARGES BY SERVICE FOR ISSSTE HOSPITALS AND EXTENSION FACILITIES, 1979

Municipios	Obstetrics	Gynecology	Pediatrics	Other	Total
Matamoros	348	202	205	765	1,520
Reynosa	477	271	176	814	1,738
Nuevo Laredo	189	146	168	542	1,045
Piedras Negras	159	76	70	417	722
Acuña	71	28	9	151	259
Juarez	332	245	217	1,396	2,190
Agua Prieta	42	13	13	42	110
Nogales	75	41	61	252	429
San Luís R.C.	83	36	68	165	352
Mexicali	773	332	244	1,480	2,829
Tijuana	411	182	216	1,089	1,898
Total 11 Municipios	2,960	1,572	1,447	7,113	13,092
% of Discharges	22.6%	12.1%	11.1%	54.3%	100%
Average Days of Stay	2.9	4.8	5.4	6.2	5.2

Source: ISSSTE, Anuario Estadístico, 1979, Tomo 2 (Mexico, D.F.).

TABLE 7.12

IMSS HOSPITALIZATIONS IN BORDER STATES FOR OBSTETRICS-GYNECOLOGY, NURSERY, PEDIATRIC, AND PREMATURE INFANT CARE, 1979

State	Obstetrics and Gynecological Admissions	Nursery Admissions	Pediatric Admissions	Premature Infant Admissions
Tamaulipas	25,824	16,925	9,565	1,272
Nuevo León	49,878	33,712	18,976	1,415
Coahuila	38,198	24,376	17,401	2,267
Chihuahua	25,469	15,312	14,198	805
Sonora	29,241	19,108	14,183	1,346
Baja California Norte	21,099	13,041	9,164	515
Total Admissions	189,709	122,474	83,487	7,620
Average Days of Stay	2.4	2.0	5.5	11.1
Deaths	214	61	2,184	1,176

Source: IMSS, Anuario Estadístico de Servicios Médicos, 1979 (Mexico, D.F.).

TABLE 7.13

LIVE BIRTHS AT ISSSTE (1979) AND IMSS (1980) FACILITIES

Municipio	ISSSTE	IMSS	Total
Matamoros	330	2,931	3,261
Río Bravo	73	114	187
Reynosa	451	2,435	2,886
Nuevo Laredo	56	1,809	1,865
Piedras Negras	154	--	154
Acuña	70	648	718
Juárez	338	6,872	7,210
Agua Prieta	29	328	357
Nogales	82	1,810	1,892
San Luís Río Col.	89	818	907
Mexicali	845	6,901	7,746
Tijuana	291	4,455	4,746
Total Live Births	2,808	29,121	31,929
Total Per 1,000 Eligibles	14.7	36.3	

Sources: IMSS, Anuario Estadístico de Servicios Médicos, 1980 (Mexico, D.F.).
ISSSTE, Anuario Estadístico, 1979, Tomo 1 (Mexico, D.F.).

TABLE 7.14

OUTPATIENT VISITS IN MAJOR MUNICIPIOS (1979 FOR ISSSTE, 1980 FOR IMSS)

Municipio	ISSSTE	IMSS	Total
Matamoros	60,398	284,359	344,757
Río Bravo	50,059	55,906	105,965
Reynosa	69,668	202,744	272,412
Nuevo Laredo	61,927	224,213	286,140
Piedras Negras	30,162	--	30,162
Acuña	23,401	86,951	110,352
Juárez	88,491	765,740	854,231
Agua Prieta	7,808	34,661	42,469
Nogales	25,671	142,060	167,731
San Luís Río Col.	19,488	77,110	96,598
Mexicali	89,507	598,259	687,766
Tijuana	69,613	409,466	479,079
Total 12 Municipios	596,193	2,881,469	3,477,662
Visits Per Eligible	3.1	3.4	

Sources: IMSS, Anuario Estadístico de Servicios Médicos, 1980 (Mexico, D.F.).
ISSSTE, Anuario Estadístico, 1979, Tomo 1 (Mexico, D.F.).

TABLE 7.15

SSA OUTPATIENT VISITS IN BORDER AREAS OF MEXICO'S NORTHERN STATES, 1979-1981

	Year		
State-Border Areas	1979	1980	1981
Tamaulipas	8,067	51,842	206,706
Nuevo León	5,699	5,947	11,870
Coahuila	30,962	32,015	36,026
Chihuahua	56,575	61,346	50,693
Sonora	36,202	41,883	32,032
Baja California Norte	89,968	83,231	238,452
Total Border Areas	227,473	276,264	575,779

Source: SSA, Dirección General de Servicios Coordinados de Salud Pública en los Estados, "Autoevaluación del Programa Nacional de Desarrollo de las Franjas Fronterizas y Zonas Libres," 1982, unpublished report.

TABLE 7.16

NUMBER OF SSA FAMILY PLANNING SERVICES PROVIDED IN BORDER AREAS OF MEXICO'S NORTHERN STATES

	Year		
State-Border Areas	1979	1980	1981
Tamaulipas	26,874	6,070	5,344
Nuevo León	567	422	483
Coahuila	9,094	8,123	6,378
Chihuahua	7,309	8,777	18,379
Sonora	9,159	9,483	8,136
Baja California Norte	10,944	8,022	49,084
Total Border Areas	63,947	40,897	87,804

Source: SSA, Dirección General de Servicios Coordinados de Salud Pública en los Estados, "Autoevaluación del Programa de Desarrollo en las Franjas Fronterizas y Zonas Libres," 1982, unpublished report.

TABLE 7.17

TOTAL IMMUNIZATIONS BY TYPE APPLIED IN MEXICO'S SIX NORTHERN STATES

Type of Immunization	Year	Institution	Total
Measles	1979	ISSSTE	33,649
		IMSS	269,753
	1980	ISSSTE	73,908
		SSA	502,021
	1981	SSA	245,933
Diptheria, Pertussis, Tetanus	1979	ISSSTE	92,372
		IMSS	691,930
	1980	SSA	359,811
	1981	SSA	221,850
Tetanus	1979	ISSSTE	37,011
Polio, Sabin	1979	ISSSTE	87,304
		IMSS	724,838
	1980	SSA	1,340,496
	1981	SSA	959,124
Polio, Monovalent	1980	ISSSTE	41,781
Polio, Trivalent	1980	ISSSTE	102,211
Triple*	1980	ISSSTE	79,409
Typhoid	1979	ISSSTE	11,546
		IMSS	444,079
	1980	ISSSTE	15,066
Tuberculosis (BCG)	1979	ISSSTE	29,719
		IMSS	320,254
	1980	ISSSTE	30,070
		SSA	206,292
	1981	SSA	124,923
PPD (Tuberculosis test)	1980	ISSSTE	712

Sources: IMSS, Memoria Estadística, 1979 (Mexico, D.F.).
ISSSTE, Anuario Estadístico, 1979, Tomo 1 (Mexico, D.F.).
ISSSTE, Contraloría General, Departamento de Estadística y Actuaria, 1980, unpublished data.
SSA, Dirección General de Servicios Coordinados de Salud Pública, 1981, unpublished data.

* Believed to indicate measles, mumps, and rubella.

TABLE 7.18

SSA IMMUNIZATIONS, DISEASE CONTROL, AND DISEASE DETECTION SERVICES IN BORDER AREAS OF MEXICO'S NORTHERN STATES

	Immunizations			Disease Control			Disease Detection		
State-Border Areas	1979	1980	1981	1979	1980	1981	1979	1980	1981
Tamaulipas	108,297	110,153	173,143	2,987	2,987	7,956	883	2,308	17,353
Nuevo León	3,178	2,917	8,615	1,792	1,191	949	579	1,255	1,611
Coahuila	31,665	33,903	27,023	759	820	637	1,259	1,325	1,683
Chihuahua	104,677	115,091	153,107	8,262	9,760	11,823	14,733	11,068	9,555
Sonora	48,300	52,688	44,536	4,606	5,556	6,448	2,559	3,087	2,599
Baja Cal. Norte	130,891	113,370	490,756	29,786	23,920	262,569	13,322	9,029	17,905
Total	427,008	428,112	897,180	48,192	44,234	290,382	33,335	28,072	50,706

Source: SSA, Dirección General de Servicios Coordinados de Salud Pública en los Estados, "Autoevaluación del Programa Nacional de Desarrollo de las Franjas Fronterizas y Zonas Libres," 1982, unpublished report.

TABLE 7.19

IMSS IMMUNIZATION COVERAGE RATES FOR CHILDREN UNDER AGE ONE YEAR IN BORDER STATES 1979

State	Diphtheria Pertussis Tetanus	Polio (Sabin)	Tuberculosis (BCG)
Tamaulipas	50.9	43.7	95.2
Nuevo León	55.0	47.0	101.9*
Coahuila	49.8	54.8	86.6
Chihuahua	51.2	42.8	115.5*
Sonora	42.3	43.7	85.8
Baja California Norte	42.5	42.9	85.6

Source: IMSS, Anuario Estadístico de Servicio Médicos, 1979 (Mexico, D.F.).

* Results from innoculations of non-eligibles.

TABLE 7.20

UNITS OF ADDITIONAL PUBLIC HEALTH SERVICES PROVIDED BY SSA IN BORDER AREAS OF MEXICO'S NORTHERN STATES

	Nutrition			Public Capacity Building			Environmental Sanitation		
State	1979	1980	1981	1979	1980	1981	1979	1980	1981
Tamaulipas	374,125	352,225	793,879	5,940	3,856	3,507	10,202	10,328	942
Nuevo León	14,363	15,107	22,376	67	66	825	175	261	340
Coahuila	392,213	373,656	505,493	1,162	3,898	3,016	9,350	9,740	6,100
Chihuahua	499,441	369,498	1,061,535	5,942	7,382	3,757	5,809	8,223	10,310
Sonora	4,350	5,247	--	635	1,023	628	10,096	6,907	6,151
Baja Cal. Norte	397,198	189,928	15,770	14,662	21,418	34,474	35,874	25,908	34,377
Total Six States	1,681,690	1,305,661	2,399,053	28,408	37,643	46,207	71,506	61,367	58,220

Source: SSA, Dirección General de Servicios Coordinados de Salud Pública en los Estados, "Autoevaluación del Programa Nacional del Desarrollo de las Franjas Fronterizas y Zonas Libres," 1982, unpublished report.

TABLE 7.21

AUTHORIZED BUDGETS FOR SSA SERVICES PROVIDED IN BORDER AREAS OF MEXICO'S NORTHERN STATES (in thousands of U.S. dollars)

	Tamaulipas			Nuevo León			Coahuila			Chihuahua		
Service	1979	1980	1981	1979	1980	1981	1979	1980	1981	1979	1980	1981
Preventive												
Immunizations	57	72	73	4	6	6	57	74	75	43	56	58
Disease Control	20	25	26	2	2	2	20	26	26	17	22	23
Disease Detection	17	22	23	1	2	2	18	24	24	15	20	21
Nutrition	21	27	27	1	2	2	21	27	27	23	29	29
Family Planning	36	46	46	2	3	3	28	37	37	25	32	32
Curative												
Outpatient Visits	372	472	486	21	30	30	283	368	382	246	319	338
Hospitalization	144	182	193	10	13	14	135	175	186	102	133	149
Public Capacity Bldg.	1	1	1	1	<1	4	5	6	6	2	3	3
Environmental Sanitation	103	133	142	3	4	5	49	64	72	57	74	87
Other Programs	606	765	1,965	40	56	101	651	847	1,759	615	796	1,513
Total	1,378	1,746	2,982	84	117	168	1,268	1,649	2,595	1,146	1,484	2,253

TABLE 7.21 (Cont.)

	Sonora			Baja Cal. Norte			(Percent of Total Budget)		
Service	1979	1980	1981	1979	1980	1981	1979	1980	1981
Preventive									
Immunizations	79	95	97	244	325	329	484 (3.8)	628 (3.8)	638 (2.6)
Disease Control	27	32	33	95	130	132	181 (1.4)	237 (1.4)	242 (1.0)
Disease Detection	24	29	30	83	111	113	158 (1.2)	208 (1.2)	213 (0.9)
Nutrition	17	21	21	59	78	78	142 (1.1)	184 (1.1)	184 (0.7)
Family Planning	38	46	46	113	148	148	242 (1.9)	312 (1.9)	312 (1.3)
Curative									
Outpatient Visits	358	430	451	1,517	2,033	2,083	2,797 (21.7)	3,652 (21.9)	3,770 (15.2)
Hospitalization	176	212	230	714	958	998	1,281 (9.9)	1,673 (10.0)	1,770 (7.1)
Public Capacity Bldg.	19	23	23	74	38	38	102 (0.8)	71 (0.4)	75 (0.3)
Sanitation/Environ.	73	88	103	372	512	543	657 (5.1)	875 (5.2)	952 (3.8)
Other Programs	770	925	1,781	4,163	5,477	9,509	6,845 (53.1)	8,866 (53.1)	16,628 (67.1)
Total	1,581	1,900	2,816	7,434	9,810	13,973	12,891 (100%)	16,706 (100%)	24,787 (100%)

Source: SSA, Dirección General de Servicios Coordinados de Salud Pública en los Estados, "Autoevaluación del Programa Nacional de Desarrollo de las Franjas Fronterizas y Zonas Libres," 1982, unpublished report.

TABLE 7.22

IMSS EXPENDITURES FOR HEALTH AND MATERNITY CARE IN MEXICO'S NORTHERN BORDER STATES, 1979

(in millions of U.S. dollars)*

State	Expenditure	Percent of Total for Mexico
Tamaulipas	$54.9	3.0
Nuevo León	126.8	6.9
Coahuila	72.9	4.0
Chihuahua	52.4	2.8
Sonora	50.3	2.7
Baja California Norte	52.0	2.8
Total Six States	$409.3	22.3
Total Mexico	$1,839.3	100.0

Source: IMSS, Anuario Estadístico, 1979 (Mexico, D.F.).

* Calculated at the rate of 22.5 pesos to the dollar.

TABLE 7.23

NATIONAL BUDGET EXPENDITURES FOR HEALTH SERVICES BY INSTITUTION, 1978

(millions of pesos)

	Institution				
National Expenditures, 1978	SSA	IMSS	ISSSTE	Others*	Total Percent of Total
Preventive Care	1,065	610	609	15	2,299(4.9)
Curative Care	4,960	27,524	4,798	2,186	39,467(83.4)
Sanitation	174	88	18	3	282(0.6)
Health Administration	4,496	778	--	--	5,273(11.1)
Total Expenditures (Percent of Total)	10,694 (22.6)	28,999 (61.3)	5,425 (11.5)	2,203 (4.7)	47,322(100.0) (100.0)
Curative/Preventive Care Ratio	4.7	45.1	7.9	145.7	

Source: Daniel Lopez-Acuña, La Salud Desigual de Mexico, 1981.

* Others include PEMEX, FFCC, SDN, etc.

TABLE 7.24

NATIONAL HEALTH CARE EXPENDITURES AS A PERCENTAGE OF GNP AND PER COVERED PERSON BY INSTITUTION

	Expenditures As Percentage of GNP			Expenditures Per Covered Person (Pesos)		
Institution	1967	1977	Percent Increase	1977	1979	Percent Increase
SSA	0.41	0.57	39.0	228	337	47.8
IMSS	1.08	1.64	51.9	1,590	2,081	30.9
ISSSTE	0.26	0.20	-23.1	771	1,243	61.2

Source: Daniel Lopez-Acuña, La Salud Desigual de Mexico, 1981.

TABLE 7.25

HUMAN RESOURCES DEVELOPMENT IN MEXICO'S NORTHERN BORDER STATES

State	Entering Class Medical Students[1]	Total Medical Students[1]	Total Nursing Students[2]	Lay Midwives Trained[3]	Lay Midwives Qualified as Instructors
Tamaulipas	737	2,580	1,350	51	4
Nuevo León	2,871	6,634	1,147	21	3
Coahuila	199	1,034	649	33	3
Chihuahua	670	2,133	493	117	8
Sonora	0	0	493	109	6
Baja California Norte	248	554	770	34	3
Total Six States	4,725	12,935	4,902	365	27

Sources: Daniel Lopez-Acuña, La Salud Desigual de Mexico, 1981.
SSA, Dirección General de Salud Materno Infantil y Planificación Familiar, "Logros del Programa de Planificación Familiar de la Secretaría de Salubridad y Asistencia en los Estados del Norte," 1982, unpublished data.

1. 1977 total for 15 schools.
2. 1976 total for 33 schools.
3. Total lay midwives trained by SSA, cumulative through 1981.

TABLE 7.26

WOMEN AGES 15-44 SURVEYED, MEXICO NATIONAL PREVALENCE SURVEY, 1979

Respondents	Border Municipios	Six Border States	Mexico National
Contraceptive Prevalence	1,467	3,978	--
Maternal-Infant Care	565	1,443	--
Total number	2,032	5,421	
Marital Status			
Married (or Consensual Union)	--	61.7	63.7
Single, Never Married	--	4.7	5.4
Widowed, Divorced, Separated	--	33.6	31.5
Total percentage		100.0	100.0
Age of Married Respondents			
15-19	8.9	7.6	--
20-24	21.2	19.8	--
5-29	22.8	22.1	--
30-34	18.6	19.5	--
35-39	14.3	16.3	--
40-44	14.2	14.7	--
Total percentage	100.0	100.0	
Average Age	30.0	30.6	30.1
Education of Married Respondents			
None	8.2	6.7	16.8
Elementary	69.8	70.3	67.4
High School +	22.0	23.0	15.8
Total percentage	100.0	100.0	100.0

Source: J.C. Smith , C.W. Warren, J. Garcia Nuñez, The U.S.-Mexico Border: Contraceptive Use and Maternal Health Care in Perspective, 1979. (El Paso: United States-Mexico Border Health Association, 1983).

TABLE 7.27

AVERAGE LIVE BIRTHS BY AGE AMONG MARRIED WOMEN IN BORDER MUNICIPIOS, AND AMONG EVER-MARRIED WOMEN IN U.S. BORDER AREAS, 1979

	Married	Ever-Married in U.S. Border Counties	
Age	Border Municipios	Mexican-American	Anglo
15-19	1.1	0.8	0.7
20-24	1.7	1.5	0.9
25-29	3.0	1.9	1.4
30-34	4.3	2.9	2.0
35-39	5.7	3.4	2.6
40-44	6.8	4.8	3.0

Source: J.C. Smith, C.W. Warren, and J. Garcia Nuñez, The U.S.-Mexico Border: Contraceptive Use and Maternal Health Care in Perspective, 1979 (El Paso: U.S.-Mexico Border Health Association, 1983).

TABLE 7.28

CONTRACEPTIVE USE AMONG WOMEN AGES 15-44, 1979
(Percentage of Women Surveyed)

	Mexico Border		U.S. Border Counties	
Single Women	Municipios	States	Mexican-American	Anglo
Current Users	1.1	1.1	12.9	26.3
Former Users	--	0.6	8.4	12.7
Never Used	--	98.3	78.7	61.0
Total	--	100.0	100.0	100.0
Married Women				
Current Users	52.4	49.9	65.5	75.2
Former Users	18.6	17.8	23.7	23.0
Never Used	29.0	32.3	10.8	1.8
Total	100.0	100.0	100.0	100.0
Current Users as Percent Of Married Women in Age Group				
Age 15-19	39.6	35.4	41.4	54.3
20-24	53.5	49.6	70.7	69.9
25-29	58.6	56.1	69.6	75.8
30-34	54.6	53.2	72.4	74.8
35-39	54.8	53.8	71.7	87.6
40-44	44.0	39.9	47.7	69.8

Source: J.C. Smith, C.W. Warren, J. Garcia Nuñez, The U.S.-Mexico Border: Contraceptive Use and Maternal Health Care in Perspective, 1979 (El Paso: United States-Mexico Border Health Association, 1983).

TABLE 7.29

TYPE OF CONTRACEPTIVE CURRENTLY USED OR REASONS DISCONTINUED, WOMEN AGES 15-44, 1979
(Percentage of Total in Location)

	Mexico Border		U.S. Border Counties
Currently Married Contraceptive Users	Municipios	States	Mexican-Americans
Pill	49.4	42.9	48.1
Sterilization	17.2	20.6	9.3
IUD	11.6	12.6	13.0
Injection	7.1	6.4	2.9
Condom	4.2	3.0	11.7
Other	10.5	14.5	15.0
Total	100.0	100.0	100.0
Reason Discontinued, Former Users, Ever-Married or Single			
Pregnancy	35.7	35.7	--
Desired Pregnancy	13.6	10.4	--
Post-Partum Lactation	11.6	11.4	--
Menopause, Hysterectomy	11.2	11.1	--
Side Effects	9.0	11.6	--
Lack of Mate	7.0	4.1	--
Fear of Side Effects	2.7	4.0	--
Opposition of Husband	1.7	1.4	--
Other	7.5	10.3	--
Total	100.0	100.0	

Source: J.C. Smith, C.W. Warren, J. Garcia Nuñez, The U.S.-Mexico Border: Contraceptive Use and Maternal Health Care in Perspective, 1979 (El Paso: U.S.-Mexico Border Health Association, 1983).

TABLE 7.30

SOURCE OF CONTRACEPTIVES AMONG CURRENT USERS, ALL WOMEN AGES 15-44 IN BORDER MUNICIPIOS, 1979
(Percentage of Total in Category)

	Contraceptive					
Source	Pill	IUD	Sterilization	Injection	Condom	Traditional Method
SSA & APC	12.4	33.5	1.5	0	6.6	0
IMSS	12.4	36.7	43.7	0	2.9	0
ISSSTE	3.2	1.1	14.5	4.0	0	0
Other Public	0.8	1.1	11.1	0	0	0
Total Public	28.8	72.4	70.8	4.0	9.5	0
Pharmacy	65.1	0	0	84.2	90.5	100.0
Private Phys.	5.5	27.6	26.1	11.8	0	0
Other Private	0.6	0	3.1	0	0	0
Total Private	71.2	27.6	29.2	96.0	90.5	100.0
Total All Sources	100.0	100.0	100.0	100.0	100.0	100.0

Source: J.C. Smith, C.W. Warren, J. Garcia Nuñez, The U.S.-Mexico Border: Contraceptive Use and Maternal Health Care in Perspective, 1979 (El Paso: United States-Mexico Border Health Association, 1983).

TABLE 7.31

PERCENTAGE OF MARRIED WOMEN IN MEXICO WITHOUT PRENATAL CARE DURING LAST PREGNANCY, 1979

	Mexico Border		
Age	Muncipios	States	Mexico National
15-19	12.5	9.7	18.5
20-24	7.2	8.9	15.6
25-29	12.6	12.1	15.3
30-34	8.7	15.0	19.6
35-39	13.4	14.0	23.9
40-44	3.9	15.6	25.9
All Married Women Ages 15-44	9.9	13.0	19.5
Education			
None	23.0	21.1	22.4
Elementary	10.0	13.6	19.5
High School	11.9	9.2	5.9
Preparatory and Above	0.0	0.6	1.8

Source: J.C. Smith, C.W. Warren, J. Garcia Nuñez, The U.S.-Mexico Border: Contraceptive Use and Maternal Health Care in Perspective, 1979 (El Paso: United States-Mexico Border Health Association, 1983).

TABLE 7.32

TRIMESTER OF PRENATAL CARE INITIATION DURING LAST PREGNANCY FOR MARRIED WOMEN AGES 15-44 RECEIVING CARE, BORDER MUNICIPIOS, 1979
(Percentage of Total in Category)

	Trimester			
Age	First	Second	Third	Total
15-19	54.4	30.4	15.2	100%
20-24	67.0	22.6	10.4	100%
25-29	73.0	27.0	--	100%
30-34	71.3	16.6	12.1	100%
35-39	71.4	20.6	8.0	100%
40-44	64.2	31.7	4.1	100%
All Married Women Ages 15-44	68.8	23.4	7.8	100%
Education				
None	59.1	31.0	9.9	100%
Elementary	62.7	27.5	9.8	100%
High School	79.6	16.8	3.6	100%
Preparatory and Above	95.8	4.2	--	100%

Source: J.C. Smith , C.W. Warren, J. Garcia Nuñez, The U.S.-Mexico Border: Contraceptive Use and Maternal Health Care in Perspective, 1979. (El Paso: United States-Mexico Border Health Association, 1983).

TABLE 7.33

SOURCE OF CARE DURING LAST CHILD BIRTH, MARRIED WOMEN AGES 15-44, 1979
(Percentage of Total in Category)

Source of Care	Mexico Border Municipios	Mexico Border States	Mexico National
IMSS	26.6	34.9	24.8
ISSSTE	5.6	4.5	3.9
SSA	13.9	10.9	9.5
Other Agency	7.2	10.2	7.1
Private Physician	32.9	26.0	23.7
Midwife	3.0	2.5	1.7
Community Nurse	0.0	0.3	0.3
Traditional Midwife or Healer	10.8	9.5	27.2
Other	0.0	1.2	1.8
Total	100.0	100.0	100.0

Source: J.C. Smith, C.W. Warren, J. Garcia Nuñez, The U.S.-Mexico Border: Contraceptive Use and Maternal Health Care in Perspective, 1979 (El Paso: U.S.-Mexico Border Health Association, 1983).

TABLE 7.34

SOURCE OF CARE DURING LAST CHILDBIRTH FOR MARRIED WOMEN AGES 15-44 IN BORDER MUNICIPIOS BY AGE AND EDUCATION, 1979

(Percentage of Total in Category)

	Physician or Paramedic			
Age	Public	Private	Traditional Midwife, Other	Total
15-19	63.2	30.6	6.2	100%
20-24	54.7	36.7	8.6	100%
25-29	53.2	31.1	15.7	100%
30-34	66.2	27.4	6.4	100%
35-39	42.6	45.1	12.3	100%
40-44	33.2	51.5	15.3	100%
Married Women Ages 15-44	53.3	35.9	10.8	100%
(All Women Ages 15-44)	(52.7)	(31.1)	(16.2)	(100%)
Education				
None	70.3	8.9	20.8	100%
Elementary	56.1	30.5	13.4	100%
High School	43.6	53.2	3.2	100%
Preparatory +	41.1	58.9	0.0	100%

Source: J.C. Smith, C.W. Warren, J. Garcia Nunez, The U.S.-Mexico Border: Contraceptive Use and Maternal Health Care in Perspective, 1979 (El Paso: U.S.-Mexico Border Health Association, 1983).

TABLE 7.35

PERCENTAGE RECEIVING POST-PARTUM CARE AFTER LAST CHILDBIRTH FOR MARRIED WOMEN AGES 15-44, 1979

Age	Mexico Border Municipios	Mexico Border States	Mexico National
15-19	59.8%	54.6%	39.2%
20-24	54.3	49.4	44.7
25-29	61.9	46.9	41.1
30-34	45.3	43.7	42.0
35-39	42.3	39.9	42.4
40-44	58.3	48.6	44.1
All Married Women Ages 15-44	52.6%	45.9%	42.5%
Education			
None	28.5%	33.1%	35.8%
Elementary	47.8	40.6	38.7
High School	67.6	59.4	63.2
Preparatory +	75.8	72.4	73.2

Source: J.C. Smith , C.W. Warren, J. Garcia Nuñez, The U.S.-Mexico Border: Contraceptive Use and Maternal Health Care in Perspective, 1979. (El Paso: United States-Mexico Border Health Association, 1983).

TABLE 7.36

OUTCOME OF LAST PREGNANCY, MARRIED WOMEN AGES 15-44, FOR BORDER MUNICIPIOS, 1979

(Percentage of Total Age Group)

	Live Birth		Stillbirth		Abortion	
Age	Border Municipios	Mexico National	Border Municipios	Mexico National	Border Municipios	Mexico National
15-19	100.0	93.9	0	2.3	0	3.8
20-24	95.9	94.6	0	1.8	4.1	3.6
25-29	95.2	95.3	0	1.0	4.8	3.7
30-34	94.9	91.2	3.0	1.3	2.1	7.5
35-39	94.0	91.1	0	2.3	6.0	6.6
40-44	92.1	90.0	0	1.4	7.9	8.6

Source: J.C. Smith, C.W. Warren, J. Garcia Nuñez, The U.S.-Mexico Border: Contraceptive Use and Maternal Health Care in Perspective, 1979 (El Paso: United States-Mexico Border Health Association, 1983).

TABLE 7.37

PERCENTAGE OF MARRIED WOMEN IN MEXICO AGES 15-44, WITH PRIOR ABORTION, WITH CARE AND SOURCE OF CARE, 1979

Married, Ages 15-44	Border Municipios	Mexico National
% With Prior Abortion	25.4%	23.3%
% Prior Abortion by Education		
None	55.7%	25.0%
Elementary	24.4	23.9
High School	16.5	19.6
Preparatory and Above	29.9	17.0
Of Women With Abortion, % Received Care	65.8%	74.3%
% by Source of Care		
Public Physician/Paramedic	30.4	60.2
Private Physician/Paramedic	69.6	32.7
Traditional Midwife/Non-Medical	--	7.1
Total Percentage	100.0	100.0

Source: J.C. Smith, C.W. Warren, J. Garcia Nuñez, The U.S.-Mexico Border: ContraceptiveUse and Maternal Health Care in Perspective, 1979 (El Paso: United States-Mexico Border Health Association, 1983).

TABLE 7.38

PERCENTAGE OF ALL WOMEN IN MEXICO, AGES 15-44 WHO BREAST-FED THEIR LAST CHILD, 1979

	Mexico Border		
Ages	Municipios	Mexico States	National
15-19	68.9	68.4	81.4
20-24	55.8	64.9	78.0
25-29	56.3	63.9	*
30-34	54.9	60.8	77.0
35-39	60.1	66.2	*
40-44	64.8	69.4	72.0
All Women Ages 15-44	58.6	64.9	77.6
Average Duration in Months	7.1	7.4	9.9

Source: J.C. Smith, C.W. Warren, J. Garcia Nuñez, The U.S.-Mexico Border: Contraceptive Use and Maternal Health Care in Perspective, 1979 (El Paso: U.S.-Mexico Border Health Association, 1983).

* Included in figure immediately above.

APPENDIX A

CRUDE BIRTHRATES 1970, 1975-1980 U.S. BORDER COUNTIES

TABLE A.1

BIRTHS BY U.S. COUNTY OF RESIDENCE (TEXAS) AND RATES PER 1,000 POPULATION: 1970, 1975-1980

County	1970	1975	1976	1977	1978	1979	1980
Cameron							
Number	4,115	--	4,865	4,833	4,728	5,094	5,489
Rate	29.32		26.77	17.93	24.14	25.12	26.17
Hidalgo							
Number	5,659	--	6,643	6,540	6,670	6,982	7,614
Rate	31.23		23.87	25.37	25.57	23.35	
Webb							
Number	2247	--	2231	2373	2305	2444	2643
Rate	30.84		25.15	25.98	24.53	25.29	26.63
Maverick							
Number	428	--	573	588	607	667	844
Rate	23.66		21.97	21.45	21.12	22.18	26.88
Val Verde							
Number	844	--	800	784	751	877	871
Rate	30.72		24.59	23.49	21.94	25.01	24.26
El Paso							
Number	9275	--	9442	9258	9462	9809	9915
Rate	25.81		21.87	20.86	20.76	20.97	20.66

Sources: Texas Department of Health, vital statistics tapes.
U.S. Census, 1970 and 1980.

TABLE A.2

BIRTHS BY U.S. COUNTY OF RESIDENCE (OUTSIDE TEXAS) AND RATES PER 1,000 POPULATION: 1970, 1975-1980

County	1970	1975	1976	1977	1978	1979	1980
Cochise							
Number	1,351	1,505	1,394	1,517	1,565	1,506	1,570
Rate	21.82	20.39	18.30	19.31	19.32	18.08	18.32
Santa Cruz							
Number	297	361	390	401	440	461	499
Rate	21.27	20.97	21.83	21.66	22.96	23.27	24.39
Pima							
Number	6,735	7,264	7,362	7,698	7,659	8,138	8,932
Rate	19.15	16.45	16.02	16.12	15.46	15.85	16.81
Yuma							
Number	1,924	1,608	1,649	1,635	1,604	1,768	1,792
Rate	31.63	21.24	20.96	20.00	18.96	20.19	19.79
Imperial							
Number	1,557	1,536	1,654	1,730	1,791	1,915	2,208
Rate	20.90	18.44	19.44	19.92	20.21	21.19	23.97
San Diego							
Number	24,568	23,623	25,079	26,647	27,084	29,322	30,877
Rate	18.09	14.67	15.11	15.77	15.38	16.19	16.58

Sources: Respective state health departments, vital statistics tapes.
U.S. Census, 1970 and 1980.

APPENDIX B

PERCENTAGES FOR LOW BIRTH WEIGHT, NO PRENATAL CARE, AND PRENATAL CARE UNKNOWN; 1970, 1975-1980 U.S. BORDER COUNTIES

TABLE B.1

PERCENTAGE OF UNDERWEIGHT BIRTHS OVER TIME, MAJOR U.S. BORDER COUNTIES: 1970, 1975-1980

County	1970	1976	1977	1978	1979	1980
San Diego	6.40	6.08	5.97	7.00	6.70	6.41
Imperial	4.69	5.41	4.55	6.66	6.14	6.19
Yuma	5.24	6.25	5.93	5.92	4.92	6.03
Pima	4.81	6.42	6.13	6.37	6.28	0.83
Santa Cruz	6.40	3.59	4.24	2.22	5.42	6.61
Cochise	8.36	6.96	7.98	7.35	7.90	7.26
El Paso	6.91	7.10	6.45	6.64	6.23	6.29
Val Verde	8.57	6.38	6.76	6.91	5.59	5.28
Maverick	5.99	4.90	5.60	5.33	5.28	4.64
Webb	7.20	7.35	7.55	7.15	6.38	5.90
Hidalgo	5.80	5.66	5.56	5.54	5.85	5.45
Cameron	6.15	5.59	5.62	4.76	4.95	4.86

Source: Respective state health departments, birth tapes.

TABLE B.2

PERCENTAGE OF "PRENATAL CARE UNKNOWN" RESPONSES, MAJOR U.S. BORDER COUNTIES: 1970, 1975-1980

County	1970	1976	1977	1978	1979	1980
San Diego	0.00	0.00	0.00	0.00	0.00	0.00
Imperial	0.00	0.00	0.00	0.00	0.00	0.00
Yuma	n.a.	n.a.	n.a.	n.a.	2.49	2.06
Pima	n.a.	n.a.	n.a.	n.a.	0.22	0.12
Santa Cruz	n.a.	n.a.	n.a.	n.a.	0.00	0.00
Cochise	n.a.	n.a.	n.a.	n.a.	0.93	0.51
El Paso	0.55	0.64	1.11	1.75	0.87	4.30
Val Verde	0.57	0.88	0.13	0.38	0.57	1.26
Maverick	9.96	3.83	7.64	9.07	7.19	4.98
Webb	54.63	78.75	80.19	80.11	82.99	61.11
Hidalgo	2.38	1.94	1.91	1.80	0.43	2.40
Cameron	1.00	0.23	0.29	0.21	0.41	5.25

Source: Respective state health departments birth tapes.

TABLE B.3

PERCENTAGE OF BIRTHS WITHOUT PRENATAL CARE, MAJOR U.S. BORDER COUNTIES: 1970, 1975-1980

County	1970	1976	1977	1978	1979	1980
San Diego	0.612	0.908	0.904	0.686	0.653	0.752
Imperial	3.360	2.830	2.759	0.949	0.574	1.541
Yuma	n.a.	n.a.	n.a.	n.a.	2.489	2.567
Pima	n.a.	n.a.	n.a.	n.a.	1.720	2.821
Santa Cruz	n.a.	n.a.	n.a.	n.a.	2.820	2.405
Cochise	n.a.	n.a.	n.a.	n.a.	1.992	1.210
El Paso	4.453	4.141	3.554	4.058	2.273	1.785
Val Verde	4.000	2.250	3.023	2.817	2.509	1.378
Maverick	2.434	2.962	1.119	1.065	1.198	0.829
Webb	2.806	1.838	2.023	1.069	0.654	0.757
Hidalgo	7.589	5.163	4.602	5.307	4.927	2.469
Cameron	13.439	7.716	8.525	6.578	5.359	2.933

Source: Respective state health departments, birth tapes.

APPENDIX C

SELECTED CAUSES OF DEATH FOR STUDY OF MORTALITY

APPENDIX C

SELECTED CAUSES OF DEATH FOR STUDY OF MORTALITY

Classification of Causes of Mortality and Morbidity based on the International Classification of Diseases (9th Revision, Clinical Modification) (ICD.9.CM):

		ICD-9	ICD-8
I.	Infective and Parasitic Diseases	001-139	001-136
	Intestinal infectious diseases	001-009	001-009
	enteritis & diarrheal diseases	008-009	008-009
	Tuberculosis	010-018	011-019
	Bacterial diseases	020-041	020-039
	diptheria	032	032
	whooping cough	033	033
	meningococcal infection	036	036
	tetanus	037	037
	septicemia	038	038
	Poliomyelitis & other viral diseases of CNS	045-049	040-046
	acute polio	045	040-043
	Viral diseases	050-079	050-079
	measles	055	055
	rubella	056	056
	mumps	072	072
	Rickettsioses & arthrop-borne diseases	080-089	080-089
	Syphilis & other veneral diseases	090-099	090-099
	Other infective & parasitic diseases	100-139	100-136
II.	Neoplasms	140-239	140-239
	Malignant neoplasms	140-209	140-209
III.	Endocrine, Nutritional, & Metabolic Diseases	240-279	240-279
	Diseases of endocrine system	240-259	240-258
	diabetes mellitus	250	250
	Nutritional deficiencies	260-269	260-269
	marasmus	261	268
	Other metabolic diseases	270-279	270-279
	obesity	278.0	277
IV.	Diseases of Blood & Blood Forming Organs	280-289	280-289
	iron deficiency anemia	280	280
V.	Mental Disorders	290-319	290-318
	alcohol dependence syndrome	303	313
	drug dependence	304	314
	nondependence abuse of drugs	305	(960-979)
VI.	Diseases of Nervous System & Sense Organs	320-389	320-389
	Inflammatory diseases of the CNS	320-324	320-324
	meningitis	320	320

		ICD-9	ICD-8
VII.	Diseases of the Circulatory System	390-459	390-458
VIII.	Diseases of the Respiratory System	460-519	460-519
	Acute upper respiratory infections	460-466	460-470
	Pneumonia	480-486	480-486
	Bronchitis, emphysema, asthma and related conditions	489-496	489-496
IX.	Diseases of the Digestive System	520-579	520-577
X.	Diseases of the Genitourinary System	580-629	580-629
XI.	Delivery & Compl. of Preg., Childbirth and Puerperium	630-676	631-678
	Ectopic & molar pregnancy	630-633	631-635
	Other preg. with abortive outcome	634-639	640-646
	Complication mainly related to pregnancy	640-648	632-634,6
	Normal delivery	650	650
	Delivery with complications	651-669	551-664
	Complications of the puerperium	670-676	670-678
XII.	Diseases of the Skin & Subcutaneous Tissue	680-709	680-709
XIII.	Diseases of the Musculoskeletal Sys., and Connective Tissue	710-739	710-739
XIV.	Congenital Anomalies	740-759	740-759
	Down's syndrome	758.0	759.3
	spina bifida	741	741.0
XV.	Certain Diseases Peculiar to Newborns	760-779	760-768
	RDS	769	765.4
	sepsis to newborns	771.8	038.9
	intracerebral hemorrhage	(767.0 772.1, and 772.2)	(761.0 766.3)
XVI.	Signs, Symptoms & Ill-Defined Conditions	780-799	770-796
XVII.	Injuries & Adverse Effects	800-999	800-999
	Fractures and injuries	800-959	800-959
	burns	940-949	940-949
	Adverse effects of medicinal agents	960-979	960-979
	Toxic effect of substances, non-medicinal as to source	980-989	980-989
	Other & unspecified effects of external causes	990-995	990-999
	child maltreatment syndrome	995.5	Y86.5

	ICD-9	ICD-8
XVIII. External Causes of Injury	E809-E995	E807-E995
Transport accidents	E807-E849	E807-E845
Non-transport accidents	E850-E995	E859-E995
effects fron nontherapeutic use of drugs	E850-E858	E859-E995
accidental poisoning	E860-E869	E859
accidental fall	E880-E888	E887
accident resulting from athletic activity	E886.0	E889
accident causd by fire & flames	E890-E899	E899
effect of neglect	E904.0	E903
effect of hunger, thirst, and exposure	E904.1-E904.9	E904
accident caused by animal or insect	E905-E906	E906
accidental drowning or submerson	E910	E910
suicide and self-inflected injury	E950-E959	E958
battered child	E967	E964
rape	E960.1	E965
fight or brawl	E960.0	E965
assault and homicide by other and unspecified means	E961-E969	E968
injury due to intervention by law enforcement	E970-E977	E976
legal execution	E978	E978

APPENDIX D

SELECTED MORTALITY RATES FOR U.S. BORDER REGIONS FOR SELECTED YEARS

TABLE D.1

U.S.-MEXICO BORDER MATERNAL AND CHILD HEALTH

INFANT MORTALITY RATE PER 1,000 LIVE BIRTHS

Region	1970	1976	1977	1978	1979	1980
I - Lower Rio Grande	20.0	13.9	12.0	10.9	9.5	9.2
II - Mid Rio Grande	18.6	12.8	13.6	15.6	10.8	9.6
II - El Paso	18.0	14.4	14.8	12.5	10.1	10.3
IV - Nogales	18.2	13.6	9.4	10.0	11.1	8.5
V - Imperial	17.0	13.0	10.1	10.2	11.4	9.2
VI - San Diego	17.8	11.7	10.5	11.1	10.6	11.4
Border Total	18.3	12.9	11.4	11.3	10.5	10.2
U.S.A.	20.0	15.2	14.1	13.6	13.1	12.6

TABLE D.2

U.S.-MEXICO BORDER MATERNAL AND CHILD HEALTH

NEONATAL DEATH RATE PER 1,000 LIVE BIRTHS

Region	1970	1976	1977	1978	1979	1980
I - Lower Rio Grande	13.5	9.3	7.8	8.1	6.5	5.8
II - Mid Rio Grande	14.1	9.7	9.3	10.1	8.5	6.4
II - El Paso	13.9	9.7	9.9	8.7	6.3	6.4
IV - Nogales	13.2	10.0	6.0	7.0	7.5	5.8
V - Imperial	11.8	9.4	6.6	7.3	7.4	5.0
VI - San Diego	13.2	7.7	7.1	7.0	6.9	7.2
Border Total	13.4	8.8	7.6	7.6	7.0	6.5
U.S.A.	15.1	10.0	9.9	9.5	8.9	8.5

TABLE D.3

U.S.–MEXICO BORDER MATERNAL AND CHILD HEALTH

POSTNEONATAL DEATH RATE PER 1,000 LIVE BIRTHS

Region	1970	1976	1977	1978	1979	1980
I - Lower Rio Grande	6.5	4.6	4.1	2.8	3.1	3.4
II - Mid Rio Grande	4.4	3.0	4.3	5.6	2.3	3.2
II - El Paso	4.1	4.7	4.9	3.8	3.8	3.8
IV - Nogales	4.9	3.6	3.3	3.0	3.6	2.7
V - Imperial	5.2	3.5	3.5	2.9	4.0	4.2
VI - San Diego	4.6	4.0	3.4	4.1	3.7	4.2
Border Total	4.9	4.1	3.8	3.7	3.5	3.7
U.S.A.	4.9	4.3	4.2	4.3	4.2	4.1

TABLE D.4

U.S.-MEXICO BORDER MATERNAL AND CHILD HEALTH

MATERNAL DEATH RATE PER 100,000 LIVE BIRTHS

Region	1970	1976	1977	1978	1979	1980
I - Lower Rio Grande	30.6	0.0	8.8	0.0	0.0	7.6
II - Mid Rio Grande	27.7	27.7	0.0	0.0	25.1	22.9
II - El Paso	21.6	42.4	10.8	0.0	30.6	10.1
IV - Nogales	37.8	0.0	10.4	10.3	9.9	0.0
V - Imperial	0.0	0.0	0.0	0.0	53.2	0.0
VI - San Diego	12.2	0.0	11.2	3.7	17.0	6.5
Border Total	20.6	8.0	9.4	3.1	17.4	6.8
U.S.A.	21.5	12.3	11.2	9.6	7.8	9.2

TABLE D.5

U.S.–MEXICO BORDER MATERNAL AND CHILD HEALTH

AGE-SPECIFIC MORTALITY RATE PER 100,000 IN COHORT

AGE UNDER 1

Region	1970	1976	1977	1978	1979	1980
I - Lower Rio Grande	2,705.7	1,729.9	1,419.0	1,250.4	1,121.7	1,143.0
II - Mid Rio Grande	2,360.8	1,370.7	1,481.7	1,672.8	1,189.8	1,135.1
II - El Paso	2,071.4	1,515.3	1,501.0	1,271.7	1,049.7	1,064.4
IV - Nogales	1,889.8	1,338.2	943.3	988.3	1,110.2	907.1
V - Imperial	1,977.2	1,,362.2	1,051.0	1,020.4	1,218.1	1,019.3
VI - San Diego	1,874.6	1,091.8	1,017.4	1,074.6	1,091.0	1,206.1
Border Total	2,055.8	1,318.3	1,165.8	1,147.2	1,105.1	1,115.6
U.S.A.	2,142.4	1,595.0	1,485.6	1,444	1,918	1,288.3

TABLE D.6

U.S.–MEXICO BORDER MATERNAL AND CHILD HEALTH

AGE-SPECIFIC MORTALITY RATE PER 100,000 IN COHORT DUE TO EXTERNAL CAUSES ONLY

AGE UNDER 1

Region	1970	1976	1977	1978	1979	1980
I - Lower Rio Grande	55.2	54.0	41.7	10.1	39.0	56.7
II - Mid Rio Grande	70.5	0.0	0.0	141.8	55.3	0.0
II - El Paso	49.6	89.1	65.7	64.7	31.8	20.9
IV - Nogales	65.6	21.6	10.5	61.1	29.7	28.9
V - Imperial	114.1	61.9	30.0	87.5	0.0	82.6
VI - San Diego	55.8	26.1	21.9	42.8	31.5	34.3
Border Total	60.0	39.4	18.8	51.5	32.0	35.8
U.S.A.	73.7	50.4	46.0	47.0	40.7	40.8

TABLE D.7

U.S.–MEXICO BORDER MATERNAL AND CHILD HEALTH

AGE-SPECIFIC MORTALITY RATE PER 100,000 IN COHORT DUE TO NONEXTERNAL CAUSES

AGE UNDER 1

Region	1970	1976	1977	1978	1979	1980
I - Lower Rio Grande	2,650.5	1,675.8	1,377.3	1,240.2	1,082.7	1,086.3
II - Mid Rio Grande	2,290.3	1,370.7	1,481.7	1,531.0	1,134.5	1,135.1
II - El Paso	2,021.8	1,426.2	1,435.3	1,207.0	1,017.9	1,043.5
IV - Nogales	1,824.1	1,316.6	932.8	927.2	1,080.5	878.1
V - Imperial	1,863.1	1,300.3	1,021.0	932.9	1,218.1	936.6
VI - San Diego	1,818.8	1,065.7	995.5	1,031.8	1,059.5	1,171.8
Border Total	1,995.9	1,278.9	1,137.0	1,095.7	1,073.1	1,079.8
U.S.A.	2,068.7	1,544.6	1,439.6	1,387.4	1,351.1	1,247.5

TABLE D.8

U.S.–MEXICO BORDER MATERNAL AND CHILD HEALTH

AGE-SPECIFIC MORTALITY RATE PER 100,000 IN COHORT

AGES 1-4

Region	1970	1976	1977	1978	1979	1980
I - Lower Rio Grande	135.0	92.0	102.2	52.0	72.8	80.3
II - Mid Rio Grande	66.9	121.4	126.2	15.4	90.2	80.8
II - El Paso	84.0	79.7	60.0	73.6	49.0	56.6
IV - Nogales	125.8	51.0	75.9	62.6	80.4	73.0
V - Imperial	156.6	101.3	115.7	56.6	87.0	85.2
VI - San Diego	78.1	53.4	69.3	66.2	41.7	56.1
Border Total	98.1	69.6	80.1	60.9	59.1	65.9
U.S.A.	84.5	69.9	68.8	69.2	65.6	63.9

TABLE D.9

U.S.–MEXICO BORDER MATERNAL AND CHILD HEALTH

AGE-SPECIFIC MORTALITY RATE PER 100,000 IN COHORT DUE TO EXTERNAL CAUSES

AGES 1-4

Region	1970	1976	1977	1978	1979	1980
I - Lower Rio Grande	42.8	33.4	35.0	26.0	37.7	29.2
II - Mid Rio Grande	28.6	56.6	47.3	0.0	30.0	14.7
II - El Paso	24.5	39.8	21.0	47.1	26.0	28.3
IV - Nogales	64.7	21.0	43.8	22.8	38.8	54.0
V - Imperial	117.5	67.6	82.6	32.3	39.6	69.7
VI - San Diego	39.0	22.4	29.4	37.2	16.3	28.1
Border Total	44.8	31.0	35.2	32.2	26.8	33.8
U.S.A.	34.7	31.6	31.1	32.3	30.4	29.2

TABLE D.10

U.S.–MEXICO BORDER MATERNAL AND CHILD HEALTH

AGE-SPECIFIC MORTALITY RATE PER 100,000 IN COHORT DUE TO NONEXTERNAL CAUSES

AGES 1-4

Region	1970	1976	1977	1978	1979	1980
I - Lower Rio Grande	92.8	58.5	67.2	26.0	35.2	51.1
II - Mid Rio Grande	38.2	64.7	78.9	15.4	60.1	66.1
II - El Paso	59.5	39.8	39.0	26.5	23.1	28.3
IV - Nogales	61.1	30.0	32.1	39.8	41.6	18.9
V - Imperial	39.2	33.8	33.0	24.2	47.5	15.5
VI - San Diego	39.0	31.0	39.9	29.0	25.4	28.1
Border Total	53.3	38.7	44.9	28.7	32.4	32.1
U.S.A.	49.8	38.3	37.7	36.9	53.2	34.7

TABLE D.11

U.S.-MEXICO BORDER MATERNAL AND CHILD HEALTH

AGE-SPECIFIC MORTALITY RATE PER 100,000 IN COHORT

AGES 5-14

REGION	1970	1976	1977	1978	1979	1980
I - Lower Rio Grande	58.0	32.0	27.2	31.4	23.9	28.9
II - Mid Rio Grande	37.3	17.6	28.8	11.3	35.8	21.6
III - El Paso	45.3	21.0	35.0	22.8	34.4	22.4
IV - Nogales	40.8	33.4	34.1	26.4	28.3	31.2
V - Imperial	60.0	39.7	27.3	42.2	18.0	23.9
VI - San Diego	36.5	35.8	31.5	25.9	23.5	31.0
Border Total	42.9	31.8	31.3	26.5	26.4	28.4
U.S.A.	41.3	34.7	34.6	33.9	32.2	30.6

TABLE D.12

U.S.-MEXICO BORDER MATERNAL AND CHILD HEALTH

AGE-SPECIFIC MORTALITY RATE PER 100,000 IN COHORT DUE TO EXTERNAL CAUSES ONLY

AGES 5-14

Region	1970	1976	1977	1978	1979	1980
I - Lower Rio Grande	21.0	15.5	11.1	17.6	11.5	14.9
II - Mid Rio Grande	23.7	5.9	17.2	5.6	24.8	10.8
III - El Paso	20.9	8.8	18.6	14.1	20.4	13.9
IV - Nogales	20.4	16.1	23.5	8.5	17.8	20.8
V - Imperial	37.9	21.4	18.2	30.2	12.0	14.9
VI - San Diego	17.8	17.3	15.7	14.5	12.2	14.9
Border Total	20.6	15.1	16.8	14.4	14.9	15.4
U.S.A.	21.7	18.9	19.4	19.2	18.3	16.8

TABLE D.13

U.S.-MEXICO BORDER MATERNAL AND CHILD HEALTH

AGE-SPECIFIC MORTALITY RATE PER 100,000 IN COHORT DUE TO NONEXTERNAL CAUSES

AGES 5-14

Region	1970	1976	1977	1978	1979	1980
I - Lower Rio Grande	37.0	16.5	16.1	13.7	12.4	14.0
II - Mid Rio Grande	13.6	11.8	11.5	5.6	11.0	10.8
III - El Paso	24.4	12.1	16.4	8.7	14.0	8.5
IV - Nogales	20.4	17.2	10.7	18.0	10.5	10.4
V - Imperial	22.1	18.3	9.1	12.1	6.0	9.0
VI - San Diego	18.6	18.5	15.7	11.4	11.4	16.1
Border Total	22.3	16.6	14.5	12.1	11.5	13.0
U.S.A.	19.6	15.8	15.2	14.7	13.9	13.8

TABLE D.14

U.S.-MEXICO BORDER MATERNAL AND CHILD HEALTH

AGE-SPECIFIC MORTALITY RATE PER 100,000 IN COHORT

AGES 5-14

Region	1970	1976	1977	1978	1979	1980
I - Lower Rio Grande	120.6	95.0	104.8	118.7	101.0	107.4
II - Mid Rio Grande	113.1	68.9	123.2	125.6	81.1	118.0
III - El Paso	131.8	117.3	110.6	102.2	115.5	97.5
IV - Nogales	150.4	127.8	151.4	132.0	113.9	107.5
V - Imperial	162.9	129.3	134.4	157.3	152.4	167.7
VI - San Diego	96.9	116.3	115.9	109.1	107.9	98.9
Border Total	115.0	114.4	120.6	115.7	109.9	104.9
U.S.A.	127.7	113.5	117.1	117.5	117.7	115.4

TABLE D.15

U.S.-MEXICO BORDER MATERNAL AND CHILD HEALTH

AGE-SPECIFIC MORTALITY RATE PER 100,000 IN COHORT DUE TO EXTERNAL CAUSES ONLY

AGES 5-14

Region	1970	1976	1977	1978	1979	1980
I - Lower Rio Grande	85.9	68.4	81.7	92.8	85.1	84.4
II - Mid Rio Grande	82.6	37.9	99.9	116.0	59.3	84.7
III - El Paso	96.5	93.0	85.9	79.2	87.1	77.8
IV - Nogales	113.4	101.7	125.5	111.3	95.6	86.7
V - Imperial	146.6	100.2	109.4	130.1	134.8	142.1
VI - San Diego	72.5	94.2	97.6	90.2	88.9	82.6
Border Total	86.4	90.2	99.2	95.2	90.1	85.6
U.S.A.	92.3	86.3	90.9	92.1	93.7	91.3

TABLE D.16

U.S.-MEXICO BORDER MATERNAL AND CHILD HEALTH

AGE-SPECIFIC MORTALITY RATE PER 100,000 IN COHORT DUE TO NONEXTERNAL CAUSES

AGES 5-14

Region	1970	1976	1977	1978	1979	1980
I - Lower Rio Grande	34.7	26.6	23.2	25.8	15.9	23.0
II - Mid Rio Grande	30.4	31.0	23.3	9.7	21.8	33.3
III - El Paso	35.3	24.4	24.7	22.9	28.4	19.7
IV - Nogales	37.0	26.1	26.0	20.7	18.3	20.9
V - Imperial	16.3	29.1	25.0	27.2	17.6	25.6
VI - San Diego	24.4	22.1	18.3	18.9	18.9	16.3
Border Total	28.6	24.2	21.4	20.5	19.8	19.3
U.S.A.	35.4	27.2	26.2	25.4	24.0	24.1